

A TAXONOMIC REVISION OF THE GENUS *CALLICARPA* L. (VERBENACEAE)* IN AUSTRALIA

Ahmad Abid Munir

State Herbarium, Botanic Gardens, North Terrace, Adelaide, South Australia 5000

Abstract

A taxonomic revision of Australian *Callicarpa* is presented. Seven species are recognized of which *C. brevistyla* (Northern Territory) and *C. thozetii* (Queensland) are described as new. *C. caudata* and *C. macrophylla* are recorded from Australia for the first time, and *C. pedunculata* is typified. *C. viridis* is regarded as a new synonym of *C. pedunculata*.

The affinities and distribution are considered for the genus and each species. A key to the species is provided and a detailed description of each is supplemented by a habit sketch of a flowering branch and analytical drawings of the flower.

Taxonomic History of the Genus

The genus *Callicarpa* was described by Linnaeus (1753), with one species, *C. americana*, the type of which came from North America. It was placed in "Tetrandria Monogynia" without reference to any family, where it was retained by Murray (1774), Lamarck (1783, 1791), Gaertner (1791), Loureiro (1793), Raeuschel (1797), Roxburgh (1814, 1820), Roemer & Schultes (1818, 1827), Roth (1821), Sprengel (1825) and others. Adanson (1763) placed it in "Jasmina", Rüling (1774) in "Sambuci", Jussieu (1789) in "Vitices", Neckler (1790) in his "Arcytophyta", and Reichenbach (1828) under the tribe "Verbeneae" in the Labiateae. In 1810, Robert Brown referred it to the family Verbenaceae where it has been retained by the majority of botanists.

Endlicher (1836) divided the family Verbenaceae into three tribes: Lippieae, Lantaneae and Aegiphileae, with *Callicarpa* in the tribe Aegiphileae. This tribe was accepted for the genus by Meisner (1840), Endlicher (1841) and Walpers (1845). In 1847, Schauer classified the Verbenaceae into three new tribes: Verbeneae, Viticeae and Avicennieae, with *Callicarpa* in the tribe Viticeae. The genus was retained in the new tribe by Bojer (1837), Miquel (1858), Benthams (1870), Benthams & Hooker (1876), Bailey (1883, 1890, 1901, 1913), Clarke (1885), Durand (1888), King & Gamble (1909), Ewart & Davies (1917), Ridley (1923), Lemée (1943) and others.

In 1895, Briquet reclassified the Verbenaceae and upgraded the tribe Viticeae to a subfamily Viticoideae. The latter consisted of four tribes: Callicarpeae, Tectoneae, Viticeae and Clerodendreae, with *Callicarpa* in the tribe Callicarpeae. This classification was adopted by Dalla Torre & Harms (1904), Lam (1919), Gardner (1931), Junell (1934), Moldenke (1936, 1959, 1971), Melchior (1964) and Lopez-Palacios (1977). The genus *Callicarpa* was divided by Briquet (1895) into two distinct groups: Group 1. *Tubulosae*, characterised by a tubular calyx the rim of which is deeply 4-fid with long and often foliaceous lobes, and Group 2. *Cyathimorphae*, characterised by its campanulate or cyathiform calyx the rim of which is subtruncate and entire or only shortly 4-(or 5-) toothed. Both of these groups were adopted by Dalla Torre & Harms (1904) and Moldenke (1936, 1959, 1971). The majority of botanists, however, have not divided this genus into groups, but have retained it in the Verbenaceae without reference to any tribe or subfamily.

*The present treatment of the genus *Callicarpa* is the first in a series of taxonomic revisions in the family Verbenaceae in Australia.

Australian History of the Genus

The first Australian records of *Callicarpa* were made by Robert Brown (1810) from northern Queensland, when he described two new species: *C. adenantha* and *C. pedunculata*. The former was later identified as a synonym of the Asian *C. candicans* (Burm.f.) Hochr. (= *C. cana* L.). Schauer (1847) described one of Robert Brown's collections from Australia as *C. longifolia* Lam. var. *floccosa* Schau. and erroneously placed *C. pedunculata* under *C. lanata* Vahl. In 1859, Hooker listed *C. cana* and *C. longifolia* in his Flora Tasmaniae. Bentham (1870) published a detailed account of the Australian Verbenaceae, and recorded three *Callicarpa* species: *C. cana*, *C. longifolia* and *C. pedunculata* R.Br. Subsequently, the occurrence of these species in Australia was recorded by F. Mueller (1882, 1889) and Bailey (1883, 1901, 1913). Domin (1929) listed these species from Australia, and described a collection of his own from northern Queensland as a new species, *C. viridis* Domin, thus raising the number of *Callicarpa* species in Australia to four. All of these four species were later recorded for Australia by Moldenke (1959, 1971).

In the present treatment, Briquet's (1895) classification of the Verbenaceae is accepted for the genus. *C. viridis* is recognised here as a new synonym of *C. pedunculata*, and *C. caudata* Maxim. & *C. macrophylla* Vahl are recorded for the first time from Australia. In all, seven species are recognised of which one from Queensland and one from the Northern Territory are newly described.

CALLICARPA L.

Callicarpa L., [Act. Soc. Reg. Sci. Ups. (1741) 80], Sp. Pl. edn 1, 1 (1753) 111.

L., Gen. Pl. edn 5 (1754) no. 127; Lam., Encycl. Méth. Bot. 1 (1783) 562; Juss., Gen. Pl. (1789) 107; Gaertn., Fruct. Sem. Pl. 2 (1791) 80; Lour., Fl. Cochinch. edn 2, 1 (1793) 80; Vahl, Symb. Bot. Pl. 3 (1794) 12; R. Br., Prod. Fl. Nov. Holl. (1810) 513; Blume, Bijdr. Fl. Ned. Ind. (1826) 817; Endl., Gen. Pl. 1 (1836) 637, no. 3712; Meisn., Gen. Pl. Vasc. 1, Tab. Diagn. (1840) 292; Gen. Pl. Vasc. 2, Comment. (1840) 200; Steud., Nomen. Bot. 1 (1840) 257; Walp., Rep. Bot. Syst. 4 (1845) 125; Schau. in DC., Prod. 11 (1847) 640; Miq., Fl. Ind. Bat. 2 (1858) 884; Bocq., Rév. Verbenac. (1863) 95, t. 8; Turcz., Bull. Soc. Imp. Nat. Mosc. 2 (1863) 217; Benth., Fl. Aust. 5 (1870) 56; Carruth. in Lindl. & Moore (eds), Treas. Bot. 1 (1870) 195; Stewart & Brandis, For. Fl. N.W. Cent. Ind. (1874) 368; Benth. & Hook. f., Gen. Pl. (1876) 1150; Kurz, For. Fl. Brit. Burma 2 (1877) 273; F. Muell., Syst. Cens. Aust. Pl. 1 (1882) 103; Bail., Synop. Qld Pl. (1883) 377; Clarke in Hook. f., Fl. Br. Ind. 4 (1885) 566; Maxim., Bull. Acad. Sc. St. Petersb. 31 (1887) 74; F. Muell., Sec. Syst. Cens. Aust. Pl. 1 (1889) 173; Briq. in Engl. & Prantl, Pflanzensam. 4, 3a (1895) 165; Bail., Qld Fl. 4 (1901) 1173; Dalla Torre & Harms, Gen. Siphon. (1904) 432, no. 7177; King & Gamble, J. Asia Soc. Beng. 74 (1908) 802; Mat. Fl. Malay. Pen. (1909) 1012; Ewart & Davies, Fl. N. Terr. (1917) 237; H.J. Lam, Verbenac. Malay. Arch. (1919) 45; H.J. Lam & Backh., Bull. Bot. Gard. Buitenz. III, 3 (1921) 9; Ridley, Fl. Mal. Pen. 2 (1923) 614; Domin, Bibl. Bot. 89 (1929) 554; Gard., Enum. Pl. Aust. Occ. 3 (1931) 112; Junell, Symb. Bot. Ups. 4 (1934) 81; Mold., Fedde Repert. Sp. Nov. Reg. Veg. 39 (1936) 291; Metcalfe & Chalk, Anat. Dicot. 2 (1950) 1034-1037, 1040, 1041; Hutch., Fam. Fl. Pl. edn 2, 1 (1959) 395; Mold., Résumé Verbenac. etc. (1959) 234, 240, 294, 301, 336, 346, 355, 408; Haines, Bot. Bihar & Orissa 2, rep. edn (1961) 743; Burb., Dict. Aust. Pl. Gen. (1963) 50; Prain, Beng. Pl. 2, rep. edn (1963) 617; Back. & Bakh., Fl. Java 2 (1965) 600; T. Cooke, Fl. Pres. Bomb. 2, rep. edn (1967) 502; Mold. Fifth Summary Verbenac. etc. (1971) 390, 402, 519, 531, 532, 604, 625, 643, 740, 757; Clifford & Ludlow, Keys Fam. & Gen. Qld Fl. Pl. (1972) 124; Airy-Shaw, Willis's Dict. Fl. Pl. & Ferns edn 8 (1973) 182; Jafri & Ghafoor in Nasir & Ali (eds), Fl. W. Pak. no. 77 (1974) 19; Lopez-Palacios, Fl. de Venezuela, Verbenac. (1977) 215; Farr, Leus. & Stasleu, Ind. Nom. Gen. Pl. 1 (1979) 263.

Type: *C. americana* L., Sp. Pl. 1 (1753) 111.

Spondylococcus Mitch. ex L., Gen. Pl. edn 5 (1754) 50, pro syn.

Burchardia Heist. ex Duham., Arab. et Arbust. 1 (1755) 111, t. 44.

Johnsonia T. Dale ex Mill., Gard. Dict. edn 7 (1759).

Tomex L. ex Adans., Fam. Pl. 2 (1763) 446.

Illa Adans., Fam. Pl. 2 (1763) 446.

Porphyra Lour., Fl. Cochinch. edn 1, 1 (1790) 69.

Agonon Rafin., Sylv. Tellur. (1838) 161.

Amictionis Rafin., loc. cit. (1838) 161.

Small trees, shrubs or undershrubs. *Stem* and branches almost cylindrical or obtusely tetragonal, more or less floccose-tomentose with stellate or dendriform hairs, sometimes mixed with simple septate hairs. *Leaves* simple, decussate, exstipulate, reticulate-veined, unicostate, petiolate. *Inflorescence* cymose, axillary, solitary in axils of upper leaves, pedunculate. *Flowers* small, bracteate, complete, actinomorphic, bisexual, hypogynous. *Calyx* of 4 sepals, persistent, tubular or shortly campanulate, truncate or minutely 4-toothed. *Corolla* of 4 petals, deciduous, 4-lobed above, tubular below. *Stamens* 4, exserted, isomerous, alternate with the corolla-lobes, epipetalous, inserted near the base of the corolla-tube; filaments filiform, glabrous, of almost uniform length; anthers dorsifixed, oblong or elliptic, 2-lobed, lobes longitudinally dehiscent. *Ovary* bicarpellary, syncarpous, 4-locular, with one ovule in each cell laterally (i.e. axillary) attached at or above the middle; style filiform, usually exserted, (included in *C. brevistyla*), stigma more or less dilated and truncate, obscurely 2-fid. *Fruit* a small globose succulent drupe, endocarp of 4 undivided pyrenes. *Seeds* exaluminous.

Number of species: World ± 150; Australia 7.

Derivation of Name

The generic name is derived from the Greek *Callos*, beauty, and *carpos*, fruit; alluding to the brightly coloured fruits of the type species. The genus was originally published by Linnaeus in *Acta Soc. Reg. Sci. Ups.* (1741) 80.

Distribution (Map 1)

The genus *Callicarpa* is widely distributed in warm temperate and tropical America, the West Indies, eastern and southern Asia including India, Burma, Thailand, Indochina, Malesia, tropical Australia, Polynesia and Oceania. So far, it has not been recorded from Europe, Africa, Central and Southern Australia, New Zealand, and Fiji, except in cultivation.

Of the seven Australian species two are endemic in Australia and the other five are widely dispersed in Malesia. The distribution of at least two of these species extends over the Indian Archipelago and up to northern India and southern China.

Comments

Briquet (1895) divided the genus into two groups, namely *Tubulosae* and *Cyathimorphae*, the former characterised by a tubular calyx with distinctly long lobes, and the latter with a campanulate or cyathiform calyx with entire or subtruncate rim bearing only 4 short teeth. All Australian species come under the group *Cyathimorphae*.

The members of the genus appear to inhabit almost every type of habitat. According to Moldenke (1936), they occur "from sea level on isolated islands to the high alpine regions of the Andes and Himalayas, from swamps and marshy ground to rocky cliffs, plateaus, sand-dunes, and dense forests". In view of their handsome fruits, many species are widely cultivated in both Old and New Worlds. Probably most, if not all, of the species can be grown from cuttings. The fruits in most species are said to be devoured extensively by birds and seed dispersal thus effected.

In different countries, the genus is known locally by different names. According to Moldenke (1936), the English names for the genus are "French-mulberry", "Spanish-mulberry", and "beauty-berry"; German names are "Wirbelbeere", "Wirtelbeere", and "Schönfrucht"; while in French a member of this genus is usually spoken of as "callicarpa". The Japanese designation is "murasaki"—a word originally denoting the colour purple, which being the most esteemed colour in Nippon, the name gradually came to be applied to anything or any person of exceptional beauty or especially esteemed. Merrill (1923) gave several local names for each *Callicarpa* species in the Philippines.

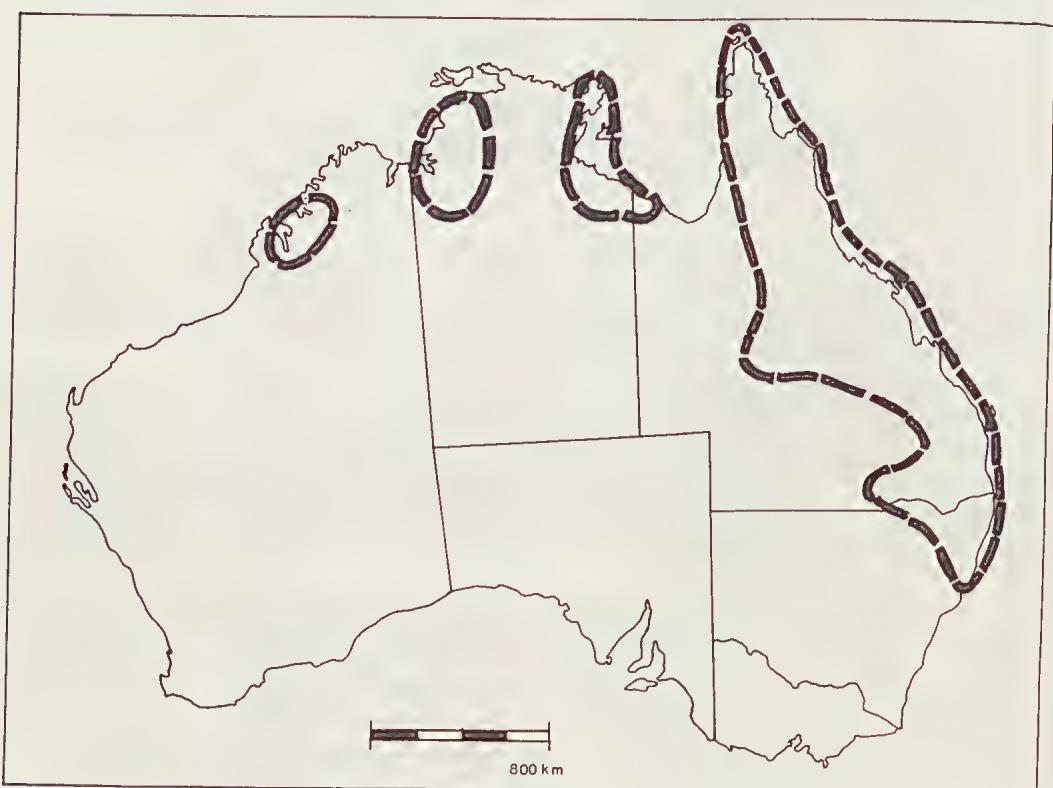
Affinities

Callicarpa is closely related to *Geunsia* Blume in its inflorescence being a panicle with few to many cymes; corolla regular; stamens isomeroous, equal, inserted at or near the base of the corolla-tube; stigma depressed-capitate or peltate; fruiting calyx non-acrescent; fruit a drupe. Nevertheless, *Callicarpa* can easily be distinguished by its leaves being isophyllous, flowers 4-merous, stamens usually 4, ovary 2-carpellary and drupe with 4 pyrenes. The leaves in *Geunsia* are anisophyllous, flowers 5-merous, stamens usually 5, ovary usually 5-carpellary and drupe with 5-2 pyrenes. *Callicarpa* is also close to *Tectona* L. f. in having a cymose inflorescence, actinomorphic flowers, regular corolla, isomeroous stamens and drupaceous fruit. *Tectona*, however, may readily be identified by its tall size (i.e. trees), drupe composed of one 4-celled pyrene and fruiting-calyx often conspicuously accrescent.

Moldenke (1936) regarded *Callicarpa* as being most closely related to *Aegiphila* Jacq. which is confined entirely to tropical and subtropical America. The latter differs in its stigma being deeply divided into 2 awl-shaped branches, flowers diclinous, fruiting-calyx enlarged and indurate, stamens inserted at or above the middle of the corolla-tube and inflorescence frequently terminal and thyrsoid.

Among the Australian genera of the Verbenaceae, *Callicarpa* seems nearest to *Premna* L. in having simple leaves; cymose inflorescence, usually 4-lobed corolla with a short tube, 4 stamens, and drupaceous fruit. The latter, however, can easily be distinguished by its inflorescence being a terminal panicle, calyx and corolla more or less 2-lipped, stamens didynamous or subequal and drupe with one 4-celled pyrene.

A key to Australian genera of the Verbenaceae will be published at the conclusion of this series of generic revisions.



Map 1. Distribution of the genus *Callicarpa* L. in Australia.

Key to the species

- 1a. Lamina cuneate at the base 2
- b. Lamina rounded, obtuse, truncate or subcordate at the base 5
- 2a. Primary peduncles longer than the petioles; corolla-lobes hairy outside 1. *C. thozetti*
- b. Primary peduncles shorter than the petioles; corolla-lobes glabrous or in *C. longifolia* pubescent outside 3
- 3a. Corolla white, pubescent outside; leaves rusty-brown or ferruginous-tomentose on abaxial surface; ovary hairy at the top; fruit white 2. *C. longifolia*
- b. Corolla purple, violet or mauve, glabrous; leaves greyish-white or yellowish-white-tomentose on abaxial surface; ovary glabrous; fruit purple, pink or violet 4
- 4a. Style included, \pm 1 mm long; leaves broadly elliptic-ovate or orbicular, entire, undulate or slightly denticulate 3. *C. brevistyla*
- b. Style exserted, 5-6 mm long; leaves usually elliptic-oblong, lanceolate or ovate-lanceolate, distinctly serrate-dentate 4. *C. candicans*
- 5a. Leaves greyish-white-tomentose on abaxial surface; peduncles equal to or somewhat longer than the petioles; fruit white 5. *C. macrophylla*
- b. Leaves yellowish-brown- or ferruginous-tomentose on abaxial surface; peduncles always longer than the petioles; fruit purple, pink or violet 6
- 6a. Indumentum on branches and peduncles mostly of simple septate hairs, 1-2 mm long; leaves narrowly lanceolate, with long tapering apex 6. *C. caudata*
- b. Indumentum on branches and peduncles of stellate-dendriform hairs, 0.5-0.8 mm long; leaves ovate-lanceolate or broadly oblong-lanceolate, with cuneate or short tapering apex 7. *C. pedunculata*

1. *Callicarpa thozetii* Munir, sp. nov.

Frutex erectus. Caulis et rami ferrugineo-tomentosi. Folia elliptica; lamina basin versus cuneata, dentata, (6-) 8-12 cm longa, 3-5.8 cm lata, superne pubescentia, infra dense ferrugineo-tomentosa. Pedunculi primarii petioli longiores, aliquantum crassi, 1-2 cm longi. Flores breviter pedicellati. Calyx tubularis, minute 4-dentatus. Corolla caerulea vel lilacina, 2-2.5 mm longa; lobis extra (i.e. dorsaliter) glandulosis et hirsutis. Stamina 4, exserta; filamentis glabris. Ovarium glabrum et glandulosum. Stylus exsertus, glaber. Fructus globosus, drupa succulenta, glaber, glandulosus, ubi maturus et vivus manifeste purpureus, 2-2.5 mm diametro.

Type: A. Thozet s.n., Rockhampton, Queensland, Australia, undated (MEL 97646, holotype).

Description (Fig. 1)

An erect branched shrub. *Stem* and branches densely clothed with ferruginous tomentum of chiefly dendriform hairs. *Leaves*: lamina elliptical, cuneate towards the base, dentate, acute, (6-) 8-12 cm long, 3-5.8 cm broad, membranous, sparsely glandular and densely pubescent above with simple and dendriform hairs, glandular and densely greyish-brown- or pale ferruginous-tomentose beneath with stellate-dendriform hairs; petioles shorter than the primary peduncles, densely dendriform-tomentose, amplexicaul at the base when young, 5-8 mm long. *Inflorescence* rather lax, primary peduncles longer than the petioles, rather thick, 1-2 cm long, densely brown-tomentose. *Flowers* shortly pedicellate; pedicel glandular, densely tomentose, 0.5-1.5 mm long. *Calyx* cup-shaped, minutely 4-toothed at the top, glandular and densely tomentose outside with stellate-dendriform hairs, glabrous inside, 1-1.5 mm long, about the same in diameter at the top. *Corolla* blue or lilac, glandular and hairy on the back (i.e. outside) of each lobe, glabrous elsewhere, 2-2.5 mm long; lobes obtuse, almost orbicular, \pm 1 mm long, nearly as broad; tube cylindrical, 1-1.5 mm long. *Stamens* inserted near the base of corolla-tube; filaments (2-) 2.5-3 mm long; anthers almost orbicular in outline, densely glandular along the connective on both the faces, \pm 0.5 mm long, nearly as broad. *Ovary* globular,

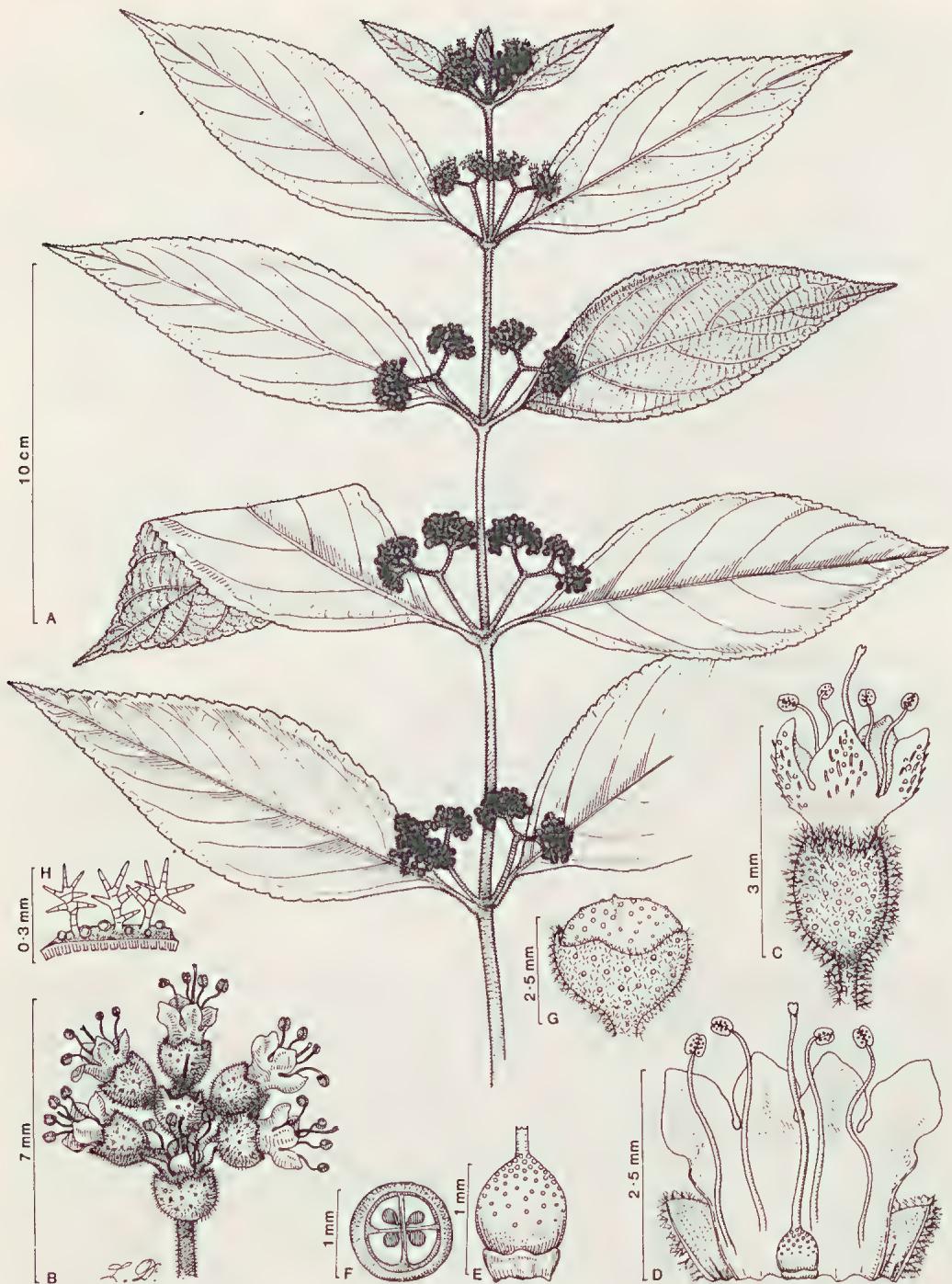


Fig. 1. *Callicarpa thozetii* Munir (A-H, A. Thozet s.n.: MEL 97646). A, flowering branch; B, cyme; C, flower; D, flower vertically cut open to show androecium and gynoecium; E, ovary; F, transverse section of ovary; G, fruit with persistent calyx; H, portion of calyx showing hairs and glands.

glabrous, glandular, 0.5-1 mm in diameter; style exserted, filiform, glabrous, 3-4 mm long, stigma capitate, slightly notched at the top. *Fruit* a globose succulent drupe, glabrous, glandular, deep purple when ripe, turning blackish when dry, 2-2.5 mm in diameter.

Specimens examined

AUSTRALIA: QUEENSLAND: *Blake 12731*, Mt Berserker, 6.iii.1937 (BRI); *Dallachy 54*, Rockhampton, 26.xii.1862 (MEL 97640 p.p., alter parte *C. pedunculata* R. Br.); *Dallachy s.n.*, loc. incert., undated (MEL 97641); *Dietrich 726*, Rockhampton, Feb. 1866 (MEL 97746). *Thozet 3*, Rockhampton, undated (MEL 97643); *Thozet s.n.*, Rockhampton, undated (MEL 97646, holotype).

Distribution (Map 2)

C. thozetii seems to be endemic in the eastern tropics of Australia where it has been recorded from near Rockhampton in Queensland.

Comments

All collections of *C. thozetii* were formerly identified as *C. pedunculata*. The long primary peduncles and ferruginous indumentum on stem and leaves are prominent and common characters between the two species.

In some cymes, one or two flowers are found to be 5-merous which is scarcely noticeable during routine examination of the specimen. These flowers are regarded here as abnormal.

Thozet's collection no. 3 (MEL 97643) from the type locality is not an isotype.

Affinities

C. thozetii is closely related to *C. pedunculata* in its primary peduncles being longer than the petioles; leaf lamina ferruginous-tomentose beneath; indumentum on stem and inflorescence of stellate-dendriform hairs; corolla blue or violet; ovary glabrous, glandular; fruit deep purple when ripe. Nevertheless, *C. thozetii* may easily be distinguished by its lamina being cuneate at the base, corolla-lobes hairy outside and stamens and style much less exserted.

C. thozetii is also allied to *C. candicans* in having the leaf lamina cuneate at the base; indumentum on branches and peduncles of stellate hairs; corolla violet-mauve; ovary glabrous, glandular and fruit purple when ripe. However, *C. thozetii* can readily be identified by its primary peduncles being longer than the petioles; corolla-lobes hairy outside and lamina ferruginous-tomentose underneath.

2. *Callicarpa longifolia* Lam., Encycl. Meth. Bot. (1783) 563, t. 69, f. 2.

Vahl, Symb. Bot. Pl. 3 (1794) 13; Raeusch., Nomencl. Bot. edn 3 (1797) 37; Willd., Linn. Sp. Pl. 1 (1798) 620; Roxb., Hort. Beng. (1814) 83; Roem. & Schult., Syst. Veg. 3 (1818) 96; Hook., Fl. Exot. 1 (1823) 133; Lindl. in Edwards (ed.), Bot. Reg. 10 (1824) t. 864; Blume, Bijdr. Fl. Ned. Ind. (1826) 817; Spreng., Syst. Veg. 1 (1825) 420; Roem. & Schult., Linn. Mant. Syst. Veg. 3 (1827) 53; Spreng., Syst. Veg. 4 (1827) 41; Roxb., Fl. Ind. 1 (1832) 394; Hassk., Cat. Pl. Hort. Bot. (1844) 136; Walp., Rep. Bot. Syst. 4 (1845) 128; Schau. in DC., Prod. 11 (1847) 645; Miq., Fl. Ind. Bat. 2 (1858) 887 & Suppl. 1 (1861) 243 & 569; Benth., Fl. Hongk. (1861) 270; Fl. Aust. 5 (1870) 57; Brand., For. Fl. NW. & Centr. Ind. (1874) 369; Kurz. For. Fl. Br. Burma 2 (1877) 275; F.-Vill., Novis. App. (1880) 158; F. Muell., Syst. Cens. Aust. Pl. 1 (1882) 103; Bail., Synop. Qld Fl. (1883) 377; Clarke in Hook. f., Fl. Br. Ind. 4 (1885) 570; Maxim., Bull. Acad. Sc. St. Pet. 31 (1887) 77; Bail., Rep. Gov. Sc. Exped. Bell.-Ker (1889) 52; K. Schum. & Hollr., Fl. Kais. Wilh. Land (1889) 119; F. Muell., Sec. Syst. Cens. Aust. Pl. 1 (1889) 173; Bail., Cat. Pl. Qld (1890) 35; Forb. & Hemsl., J. Linn. Soc. (Bot.) 26 (1890) 253; Kuntze, Rev. Gen. Pl. 1 (1891) 503; Bail., Bot. Bull. 8 (1893) 81; Qld Woods (1899) 104; Hemsl., Kew Bull. & Misc. (1899) 108; Koord. & Valeton, Bijdr. Booms Java, no. 7 (1900) 176; Bail., Qld Fl. 4 (1901) 1174; K. Schum. & Lauterb., Fl. D. Südsee (1901) 522; Williams, Bull. Herb. Boiss. 2nd Ser. 5 (1905) 430; King & Gamble, J. As. Soc. Beng. LXXIV, 4 (1909) 807; Fl. Mal. Penin. no. 21 (1909) 1017; Koord., Exkurs.-Fl.

Java 3 (1912) 134; Bail., Comp. Cat. Qld Pl. (1913) 386; H.J. Lam, Verbenac. Malay. Arch. (1919) 86; B. Leeuwen, Faber & Smith, Bull. Jard. Bot. 3rd Ser. 4 (1922) 284; Merr., Enum. Philip. Fl. Pl. 3 (1923) 385; Ridley, Fl. Mal. Penin. 2 (1923) 616; White, Proc. Roy. Soc. Qld 34 (1923) 50; Heyne, Nutt. Pl. Ned. Ind. 2nd edn 2 (1927) 1311; Domin, Bibl. Bot. 89 (1929) 555; Hochr. in Candollea 5 (1934) 190; Junell, Symb. Bot. Ups. 4 (1934) 81, 83; Mold., Fedde Repert. Sp. Nov. Reg. Veg. 40 (1936) 96; Résumé Verbenac. etc. (1959) 200, 208, 211, 234, 241-248, 298, 319; Fifth Summary Verbenac. etc. (1971) 344, 349, 390, 404-408, 410-413, 418, 526, 570; Phytologia 21 (1971) 376; Everist, Poison Pl. Aust. (1974) 518; Wrig. & Fagg, Aust. Native Pl. (1979) 184.

Type: Sonnerat s.n., Malacca, Malaysia.—(P. LA, microfiche!). Collector's name and the locality for the type are taken from the protologue because they are lacking on the microfiche of Lamark's herbarium in Paris.

C. lanceolaria Roxb., Fl. Ind. 1 (1820) 409; Link, Enum. Pl. 2 (1822) 124; Spreng., Syst. Veg. 1 (1825) 420; Roem. & Schult., Linn. Mant. Syst. Veg. 3 (1827) 54; Walp., Rep. Bot. Syst. 4 (1845) 129.

Type: *H. Koamoora* 763, Silhet, Eastern India, 1815 (C, microfiche!).

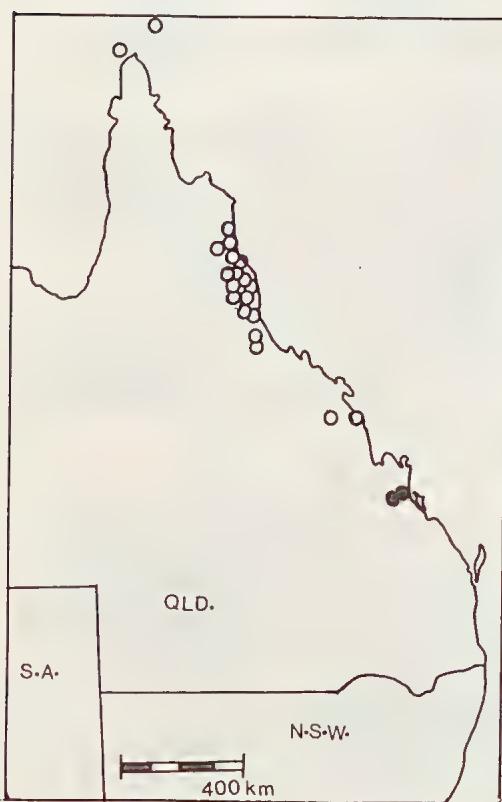
C. albida Blume, Bijdr. Fl. Ned. Ind. (1826) 818.

Type: "Crescit in montosis. Floret omni tempor" (n.v.). In the protologue there is no mention of any locality or the name of a collector, but the type is most likely in Herb. L or BO, n.v.

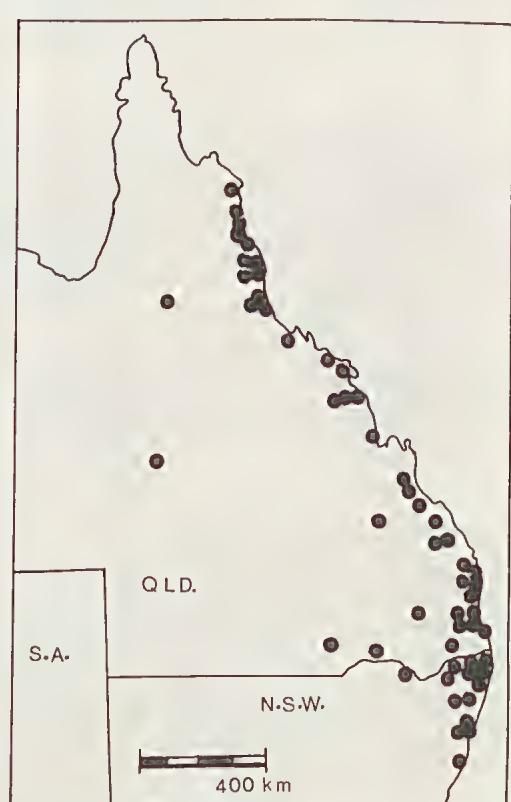
C. roxburghiana Roem. & Schult., Linn. Mant. Syst. Veg. 3 (1827) 54; Walp., Rep. Bot. Syst. 4 (1845) 128.

Type: Prince of Wales Island (n.v.). This taxon is based on *C. longifolia* Roxb. (1820).

C. cana auct. non Linn.: Wall., Cat. (1828) no. 1834 p.p.



Map 2. *C. thozetii* ●
C. longifolia ○



Map 3. *C. pedunculata* ●

C. oblongifolia Hassk., Cat. Hort. Bot. Bogor. (1844) 136, nom. nud.

C. blumei Zoll. & Mor., Syst. Verz. Zoll. (1846) 53, based on the description and the specimen of Blume's *C. longifolia* Lam. (1825).

Type: "Crescit in fruticetis montosis. Floret toto anno". There is no mention of collector or the locality (n.v.).

C. longifolia Lam. var. *floccosa* Schau. in DC., Prod. 11 (1847) 645, excl. syn. *C. adenantha* R. Br.; Miq., Fl. Ind. Bat. 2 (1858) 888; Kuntze, Rev. Gen. Pl. 3 (1891) 503; Heyne, Nutt. Pl. Ned. Ind. 2nd edn, 2 (1927) 1311; Mold., Phytologia 2 (1971) 376.

Type: *Roxburgh* s.n., Eastern India, Prince of Wales Island, undated (DC-G, microfiche!). *Gaudichaud* s.n., Singapore & Manila, 1839 (DC-G, microfiche!). *Thunberg* s.n., Java, undated (DC-G, microfiche!). *Blume* & *Jungh* s.n., loc. cit. (n.v.). *R. Brown* s.n., N. Hollandia (n.v.).

C. longifolia Lam. var. *subglabrata* Schau. in DC., Prod. 11 (1847) 645, excl. syn. *C. japonica* Thunb.; Heyne, Nutt. Pl. Ned. Ind. 2nd edn, 2 (1927) 1311; Beer & H.J. Lam, Blumea 2, no. 3 (1936) 221; Hatus, J. Jap. Bot. 24 (1949) 81; Burkill, Dict. Econ. Prod. Mal. Penin. 1 (1966) 407, 408.

Type: *Wallich* cat. no. 1829, in India orient. e. gr. Prov. Silhet, undated (DC-G, microfiche! 3 spec.). *Zollinger* 156, 223, 349, Java, 1843 (DC-G, microfiche!). *Blume* s.n., *Junghuhn* s.n., Java, (n.v.). *Cuming* 1330, Philippine (n.v.).

C. lanata Vahl var. *uberior* Miq., Fl. Ind. Bat. 2 (1858) 887.

Type: From Sumatra, undated (n.v.). The collector's name is not given with the protologue.

C. longifolia Lam. var. *lanceolaria* (Roxb.) Clarke in Hook. f., Fl. Br. Ind. 4 (1885) 570, based on *C. lanceolaria* Roxb. (1820); Prain, Beng. Pl. 2, rep. edn (1963) 618.

Type: As for *C. lanceolaria* Roxb.

C. attenuifolia Elm., Leafl. Philip. Bot. 8 (1915) 2870.

Type: *A.D.E. Elmer* 13536, Cabadbaran (Mt Urdaneta), Province of Agusan, Mindanao, Aug. 1912 (n.v.), probably in Herb. PNH.

C. longifolia Lam. var. *areolata* H.J. Lam, Verbenac. Malay. Arch. (1919) 90.

Type: *Leeuwen* & *Reijnvaan* 1349, Kalao Toa-Island, 5.v.1903 (n.v., probably in Herb. L or BO).

Description (Fig. 2)

A shrub or small tree 2-4 m tall. *Stem* and branches densely stellate-hairy when young, almost glabrescent when mature. *Leaves*: lamina lanceolate, oblong, oblong-lanceolate or narrowly elliptic-oblong, acuminate with a long point, serrate, cuneate at the base, 7-18 cm long, 2.5-6.5 cm broad, membranous, green, almost glabrous or sprinkled with very short hairs above, more copiously tomentose and glandular underneath, often slightly brownish-rusty beneath; petiole stellate-hairy, 0.7-2(-2.5) cm long. *Inflorescence* densely stellate-hairy when young, almost glabrescent when mature; primary peduncles shorter than the petioles, densely stellate-hairy, rusty, 0.3-1.3 (-1.7) cm long. *Flowers* subsessile; pedicels \pm 0.5 mm long. *Calyx* cup-shaped, minutely 4-toothed, densely glandular and floccose outside, glabrous within, 1-1.5 mm long, \pm 1 mm in diameter in flower and up to 2 mm diameter in fruit. *Corolla* white, pubescent outside with a few glands on the back of each lobe, glabrous within, 2-2.5 mm long; lobes broadly ovate or almost orbicular, obtuse, 0.5-1 mm long, nearly as broad at the base; tube cylindrical but narrowed towards the base, \pm 1.5 mm long, almost 1 mm in diameter at the top. *Stamens* inserted near the base of the corolla-tube; filaments filiform, glabrous, 2.5-3.5 (-4) mm long; anthers oblong, glandular on both sides, 0.5-0.8 mm long, \pm 0.5 mm broad. *Ovary* globose, densely glandular with a few hairs at the top, \pm 0.5 mm in diameter; style exserted, glabrous, 4-6 mm long, stigma capitate, slightly bifid. *Fruit* globular, almost succulent when fresh, 1.5-3 mm in diameter, glandular with a few small hairs on the top, white when mature.

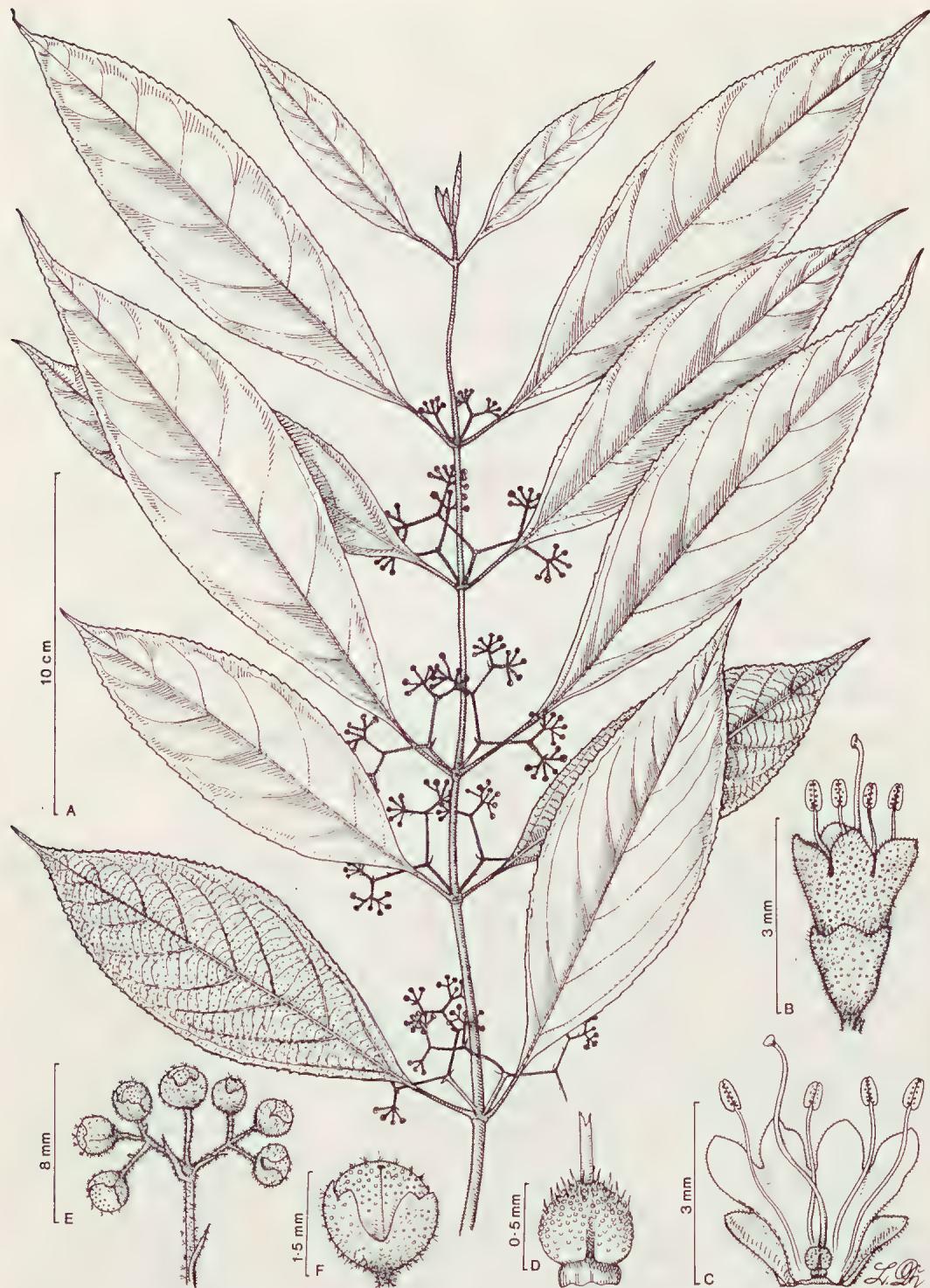


Fig. 2. *Callicarpa longifolia* Lam. (A-F, L.J. Webb & J.G. Tracy 5739: BRI). A, flowering branch; B, flower; C, flower vertically cut open to show androecium and gynoecium; D, ovary; E, infructescence; F, fruit with persistent calyx.

Representative specimens (collections seen: Australian 47, non-Australian 116)

AUSTRALIA: QUEENSLAND: *Andrews & Simon* 181, near Cardwell, 10.v.1975 (BRI); *Dallachy* s.n., Murray River, 4.xii.1860 (MEL 97627); *Dallachy* s.n., Rockingham Bay, 2.xii.1864 (MEL 97628); *Dietrich* 2458 & 2498, Port Mackay, 16.v.1869 (MEL, PR); *Lawrie* s.n., Murray Island, 30.i.1971 (BRI 118976); *Sayer* 199, Harvey's Creek, Russell River, 1887 (MEL); *Stocker* 683, S.F.R. 194, Compartment 54, 17° 20' S, 145° 25' E, 15.iv.1971 (BRI, CANB, LAE, QRS); *Webb & Tracy* 7883, Thursday Island, 1962 (BRI); *White* 1405, Daintree River, 29.xi.1929 (BRI); *White* 12977, Eungella Range, 3.ix.1938 (BRI, CANB).

NEW GUINEA: *Brass* 1013, Vailala River, 19.ii.1926 (BRI); *Coode & Katik* NGF 32782, Aiome to Ramu River, 11.iii.1968 (BRI, CANB, L, LAE); *Craven & Schodde* 1414, near Kwaimengu, 23.iv.1966 (BRI, CANB, A, K, L, LAE, PNH, US); *Forbes* 783, S.E. New Guinea, 1885-6 (MEL); *Forman & Vinas* LAE 60285, near Boridi sub-dist., Port Moresby, 09° 05' S, 147° 38' E, 2.x.1973 (BRI, L, LAE); *Henty* NGF 11980, Busu River near Lae, 5.iv.1960 (BRI, CANB, LAE, MEL); *Millar* NGF 12223, Busu River near Lae, 21.vi.1960 (BRI, CANB, LAE); *Schodde & Craven* 4274, junction of Lohiki and Vailala Rivers, 24.i.1966 (BRI, CANB, A, BO, K, L, LAE, SING, US).

NEW BRITAIN: *K.J. White* NGF 10045, near Urin, Eliak, South New Britain, 6.v.1958 (BRI, LAE).

MOLUCCAS: *Buwalda* 4316, Tanimbar Island, P. Jamdena, 19.iii.1938 (BRI, BO).

BORNEO: *Chew, Corner & Stainton* s.n., Mt Kinabalu, 06° 00' N, 116° 35' E, 1961 (CANB); *Elmer* 20102, Sandakan, Myburgh Prov., Oct.-Dec. 1921 (BRI); *Kostermans* 6503, Loa Djanan, W. of Samarinda, 17.iv.1952 (BRI, BO).

JAVA: *Andrews* s.n., Christmas Island, 1908 (MEL 97782); *Kostermans* 18557, W. Sumbawa, Mt Batulante, 29.iv.1961 (CANB, BO).

SUMATRA: *Beccari* 491, Ajer Mantjoer, W. Sumatra, Aug. 1878 (MEL).

MALAYA: *Burkill* 245, Pangkor Island, 8.vii.1955 (BRI, SING); *Millard* KL 1863, Ulu Langat, Selangor, 25.xi.1959 (QRS, KEP).

THAILAND: *Kasin* 395, near Neeckay, Wangka, 16.v.1946 (BRI, L).

BURMA: *Wood* s.n., Pangsalap, 1.i.1903 (MEL, CAL).

INDIA: *U. Singh* 81, Dehra Dun, U.P., 1928 (BRI, DD).

Distribution (Map 2)

In Australia, *C. longifolia* is found only in Queensland where it occurs chiefly in the north-eastern coastal region between Cooktown and Mackay. Within this area, the main concentration of this species is on the Atherton Tableland. There are also three records from the Torres Strait Islands of which one came from Murray Island close to the New Guinea shore and the others from Thursday Island and Prince of Wales Island near the tip of Cape York Peninsula. The record by Roxburgh of this species from the Prince of Wales Island (Schauer, 1847) has not been confirmed by modern collections. It is doubtful whether Roxburgh did any collecting on the island with that name in northern Queensland.

From outside Australia, specimens have been examined from New Guinea, New Britain, the Moluccas, Borneo, Java, Sumatra, Malaya, Thailand, Burma and India. Lam (1919) gave its distribution as being from Eastern India, Bangladesh, most parts of Malesia but not Australia. In addition to the above localities, Moldenke (1971) recorded it from Peru, Bhutan, Southern China, Hainan, Andaman Islands, Mergui Archipelago and Indochina. From Australia, he recorded it from Queensland and the Northern Territory. It is possible that this species may be found in the tropics of the Northern Territory but so far no Australian herbarium seems to have any collection from this area.

Everist (1974) recorded it as growing "mainly in wet tropical lowland areas of North Queensland, often as regrowth in cleared swampy rainforest country".

Comments

Besides the typical variety, Schauer (1847) described two varieties under this species, namely var. *subglabrata* and var. *floccosa*. He based the former on specimens from

eastern India, Java, the Philippines and Japan. The last named locality seems doubtful because this species is not known to occur in Japan. Similarly, Schauer included *C. japonica* Thunb. (1760) in the synonymy of var. *subglabrata*, but the former had already been recognized as a distinct species. He based the other variety, *floccosa*, on specimens from eastern India, Singapore, Java, the Philippines, the Prince of Wales Island and the tropics of Nova Hollandia in which areas this species seems to occur commonly. Under this variety, *C. adenantha* R. Br. (1810) was cited as a synonym but this has been recognized by Bentham (1870) as conspecific with *C. candicans* (Burm. f.) Hochr. (= *C. cana* L.).

Both the varieties have been distinguished chiefly on the nature, colour and density of indumentum on branches, inflorescence and calyces. Since *C. japonica* Thunb. and *C. adenantha* R. Br. have been included under var. *subglabrata* and var. *floccosa* respectively, it seems that the characters used in distinguishing these varieties have probably been taken partly from these two species. In any case, the colour and density of indumentum in *C. longifolia* varies at different stages of plant growth. In young plants, the indumentum is fairly dense and deep rusty-brown, but in fully developed or old plants, the leaves, branches and peduncles become somewhat glabrescent and the colour of indumentum also fades to a certain degree. In view of this, the characters used by Schauer (1847) in distinguishing var. *subglabrata* and var. *floccosa* from var. *longifolia* are considered unstable. Therefore, the former two varieties are regarded here as belonging to the typical variety.

According to Moldenke (1936) this species "is extremely variable and polymorphic, and has been greatly misinterpreted in the past. Specimens of all sort of widely separated species have from time to time been included under the name *C. longifolia*, causing a great confusion in the literature".

Bentham (1870) recorded this species as: "*C. longifolia* Lam. ex Schau in DC . . ." showing that this name was first validated by Schauer (1847). Actually, this species was named and first validly published by Lamarck (1783) who provided it with a short description in Latin and a long one in French. Therefore, the authorship of this species should be referred to Lamarck, not Schauer.

According to Dr T.G. White's note with his collection no. BRI 2060727 "the bark of this species is used by the Javanese on the Johnstone River as a substitute for the Betel-leaf, when chewing the Areca nut with lime". Burkhill (1966) says that "it is one of the chief plants used for poulticing by Malays, and is also administered internally. For colic a decoction of the leaves is drunk. A similar decoction is given after childbirth, and for fever. For syphilis an infusion of the root is used and Rumpf says a decoction of the root is useful for diarrhoea. A decoction of the root of some species of *Callicarpa*, such as this, is prescribed for distention of the stomach, the treatment comprising bathing the body by a decoction of the leaves. The leaves are used by the Malays for poulticing in fever, and for rubbing over the body and are applied to swellings. A lotion containing the juice of the root is used for nasal caries"

Of all the Australian *Callicarpa* species, *C. longifolia* is the only one with a white corolla. This species is called "long-leaved *Callicarpa*" by some. It is said to bloom chiefly from June to August, but in greenhouse cultivation it may bloom at other times as well.

According to Moldenke (1971), this species is cultivated in Australia, Java, Malaya, India, Belgium, France, Peru and the United States of America.

Affinities

C. longifolia is closely related to *C. brevistyla* and *C. candicans* in its leaf lamina being cuneate at the base; primary peduncles shorter than the petioles and indumentum

on branches and peduncles of stellate-dendriform hairs. However, *C. longifolia* may easily be distinguished by its corolla being white, pubescent outside; leaves rusty-brown or ferruginous-tomentose underneath; ovary hairy at the top and fruit white when mature. *C. longifolia* is also allied to *C. macrophylla* in having the indumentum on the branches and peduncles of stellate-dendriform hairs and fruit white when mature. The latter, however, can easily be identified by its lamina being obtuse or rounded at the base, greyish-white tomentose beneath; corolla violet, glabrous; peduncles a little longer than the petioles and fruit glabrous.

3. *Callicarpa brevistyla* Munir, sp. nov.

Frutex erectus, ca 1.5 m altus. *Caulis* et rami cinerascentio-tomentosi. *Folia* circumscriptio late elliptico-ovata vel fere orbiculata, 10-17 cm longa, 5-12 cm lata. *Pedunculi* primarii petiolo breviores. *Flores* breviter pedicellati. *Calyx* tubularis, minute 4-dentatus. *Corolla* purpurea vel malvina, 4-lobata, glabra, glandibus in dorso quoque lobi paucis, 2.5-3 (-4) mm longa. *Stamina* 4, exserta, filamentis 4-6 mm longis. *Ovarium* glabrum, glandulosum, 0.5-1 mm diametro. *Stylus* brevissimus, inclusus, glaber, ca 1 mm longus. *Fructus* drupa globula, 2-3 mm diametro, ubi vivus purpureus.

Type: N. Byrnes 1309, Mt Bunday, Northern Territory, Australia, 22.i.1969 (NT, holotype; DNA, isotype).

Description (Fig. 3)

An erect shrub of about 1.5 m. *Stem* and branches densely clothed with a grey or greyish-rusty indumentum of stellate hairs. *Leaves*: lamina broadly elliptic-ovate or almost orbicular, entire or somewhat undulate and denticulate, acuminate, \pm cuneate at the base, membranous, 10-17 cm long, 5-12 cm broad, glandular and stellately greyish-pubescent-tomentose underneath, puberulous or glabrescent above when mature; petiole densely clothed with greyish-rusty stellate hairs, 1.5-3 cm long. *Inflorescence* rather lax; primary peduncle shorter than the petiole, densely tomentose, 0.5-1.3 cm long. *Flowers* shortly pedicellate, 4-merous; pedicels glandular and pubescent, 0.5-1 mm long. *Calyx* tubular, minutely 4-toothed, glandular and pubescent outside, glabrous inside, 1-1.5 mm long, \pm 1 mm in diameter distally. *Corolla* purple or mauve, glabrous, with a few glands on the back of each lobe, 2.5-3 (-4) mm long; lobes broadly ovate-orbicular, obtuse, 1-1.5 mm long, \pm 1 mm broad; tube 1.5-2 mm long. *Stamens* 4, exserted, inserted at the base of the corolla-tube; filaments 4-6 mm long; anthers oblong, glandular on the back, \pm 1 mm long, \pm 0.5 mm broad. *Ovary* globose, glabrous, glandular all over, 0.5-1 mm in diameter; style short, included, filiform, glabrous, \pm 1 mm long, stigma capitate. *Fruit* globular drupe, glabrous, somewhat succulent and glandular-glutinous when fresh, 2-3 mm in diameter, purple.

Specimens examined

AUSTRALIA: NORTHERN TERRITORY: Byrnes 1309, Mt Bunday, 22.i.1969 (NT, holotype; DNA, isotype). Levitt s.n., Angurugu, Groote Eylandt (Island), 22.iii.1972 (DNA 4438). Levitt s.n., loc. cit. 10.iv.1972 (DNA 4444).

Distribution (Map 4)

C. brevistyla seems to be endemic in northern Australia where it has been recorded from Arnhem Land in the Northern Territory and from neighbouring Groote Eylandt in the Gulf of Carpentaria.

Comments

The leaves and inflorescences of *C. brevistyla* and *C. candicans* are similar in several characters, and it is, therefore, not possible to separate these taxa without flowers. In view of their similar appearance, all *C. brevistyla* collections have previously been identified as *C. candicans*.

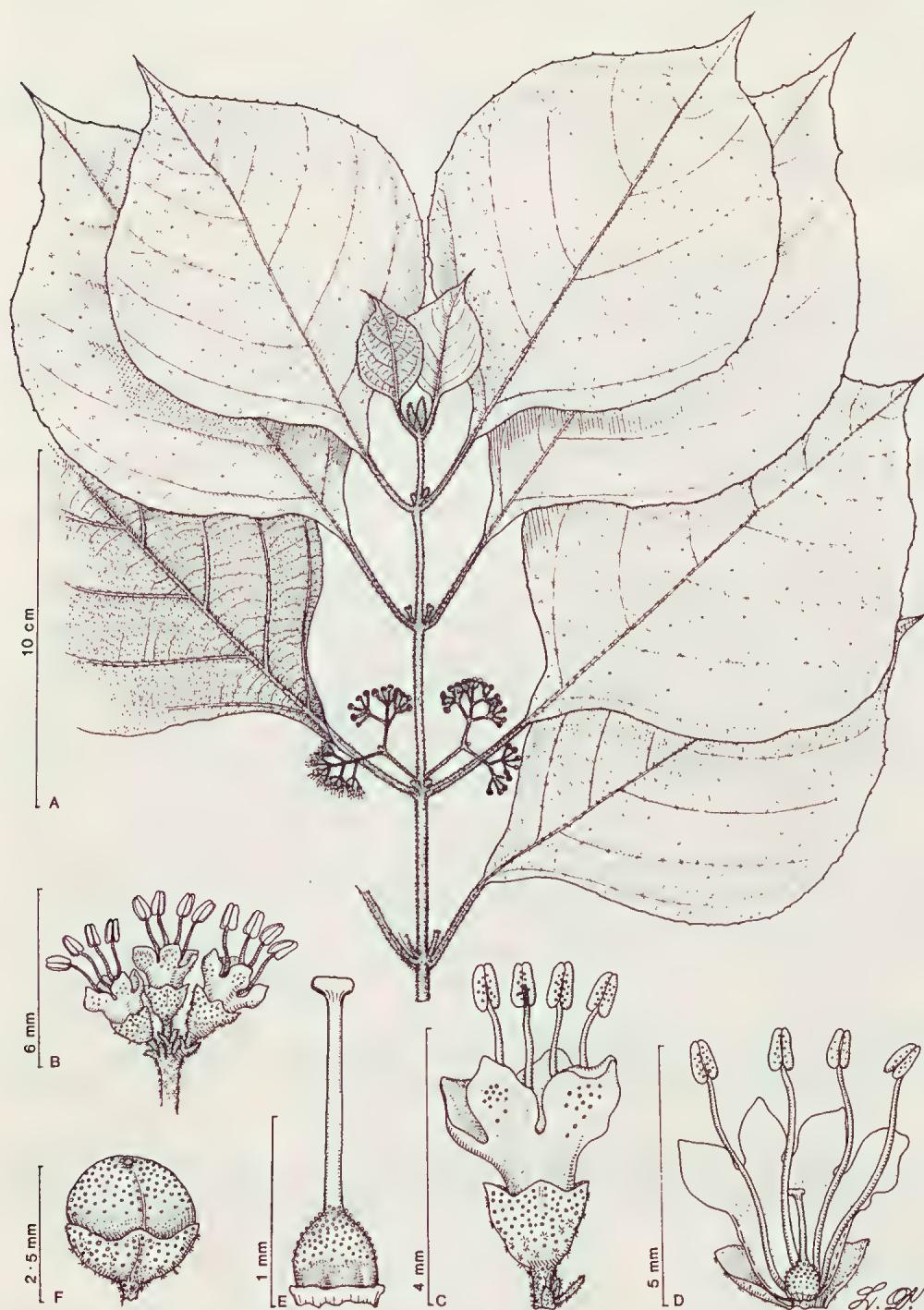


Fig. 3. *Callicarpa brevistyla* Munir (A-E, N. Byrnes 1309: DNA, F, D. Levitt s.n., DNA 4444). A, flowering twig; B, cyme; C, flower; D, flower vertically cut open to show androecium, gynoecium and short included style; E, gynoecium; F, fruit with persistent calyx.

Affinities

C. brevistyla is closely related to *C. candicans* in its stem and leaves being covered with stellate hairs; lamina cuneate towards the base, greyish-tomentose underneath; peduncles shorter than the petioles; corolla violet, glabrous; ovary glandular, glabrous; fruit purple. However, *C. brevistyla* may easily be distinguished by its short included style of about 1 mm long. The leaf characters given in the key are helpful but not always entirely reliable.

C. brevistyla is also close to *C. longifolia* in having indumentum of stellate hairs; lamina cuneate at the base and peduncles shorter than the petioles. The latter, however, may easily be identified by its leaves being almost glabrous or slightly rusty-tomentose underneath; corolla white and pubescent outside; ovary hairy at the tip; style much longer, exserted, 4-6 mm long, and fruit white. *C. brevistyla* is endemic in northern Australia whereas *C. candicans* and *C. longifolia* are widespread in Asia and elsewhere.

4. ***Callicarpa candicans* (Burm. f.) Hochr.**, Candollea 5 (1934) 190; Mold., Résumé Verbenac. etc. (1959) 208, 213, 241-247, 319, 355; C. Back. & Bakh., Fl. Java 2 (1965) 601; Mold., Fifth Summary Verbenac. etc. 1 & 2 (1971) 344, 404-409, 417-419, 570, 645, 971; Mold., Phytologia 2 (1971) 331.

Urtica candicans Burm. f., Fl. Ind. (1768) 197, basionym.

Type: "Habitat in Java",—(n.v., probably in Herb. G). Collector's name is not given in the protologue.

Callicarpa cana L., Mant. 2 (1771) 198; Vahl, Symb. Bot. Pl. 3 (1794) 12; Raeusch., Nomencl. Bot. edn 3 (1797) 37; Willd., Linn. Sp. Pl. 1 (1798) 620; Roem & Schult., Syst. Veg. 3 (1818) 94; Roxb., Fl. Ind. 1 (1820) 406; Sims, Bot. Mag. 47, N. Ser. 5 (1820) t. 2107; Blume, Bijdr. Fl. Ned. Ind. (1826) 817; Spreng., Syst. Veg. I (1825) 419; Roem. & Schult., Linn. Mant. 3 (1827) 1311; Decne, Nouv. Ann. Mus. Hist. nat. Par. 3rd Ser. 3 (1834) 401; Span., Linnaea 15 (1841) 330; Hassk., Cat. Pl. Hort. Bot. Bog. (1844) 136; Walp., Rep. Bot. Syst. 4 (1845) 127; Schau. in DC., Prod. 11 (1847) 643; Miq., Fl. Ind. Bat. 2 (1858) 885 & Suppl. 1 (1861) 243 & 569; Benth., Fl. Aust. 5 (1870) 56; F.-Vill., Novis. App. (1880) 158; F. Muell., Syst. Cens. Aust. Pl. 1 (1882) 103; Bail., Synop. Qld Fl. (1883) 377; C.B. Clarke in Hook. f., Fl. Br. Ind. 4 (1885) 568; Forbes, Wand. Nat. f. Malay. Arch. 2 (1885) 226; Hemsl., Chall. Report. Bot. 1 (1885) 110 & 176; Vidal, Phan. Cuming. Philip. (1885) 134; Rev. Pl. Vasc. Filip. (1886) 208; F. Muell., Sec. Syst. Cens. Aust. Pl. 1 (1889) 173; Forbes & Hemsl., Fl. Sim. 2, J. Linn. Soc. (Bot.) 26 (1890) 252; Bail., Cat. Pl. Qld (1890) 35; Warb., Bot. Jahrb. 13 (1891) 426; Qld Fl. 4 (1901) 1174; K. Schum. & Lauterb., Fl. D. Südsee (1901) 522; Merr., Rep. Invest. Java 1902 (1903) 51; Williams, Bull. Herb. Boiss. 2nd Ser. 5 (1905) 430; King & Gamble, J. As. Soc. Beng. LXXIV, 4 (1909) 806; Fl. Mal. Penin. no. 21 (1909) 1016; Merr., Fl. Manila (1912) 401; Bail., Comp. Cat. Qld Pl. (1913) 382; Elm., Leafl. Philip. Bot. 6 (1913) 2084, 2085; Ewart & Davies, Fl. North. Terr. (1917) 237; H.J. Lam, Verbenac. Malay. Arch. (1919) 68; Merr., Enum. Philip Fl. Pl. 3 (1923) 382; Ridley, Fl. Mal. Penin. 2 (1923) 616; Heyne, Nutt. Pl. Ned. Ind. 2 edn 2 (1927) 1311; Domin, Bibl. Bot. 89 (1929) 554, fig. 179 p.p.; Gard., Enum., Pl. Aust. Occ. 3 (1931) 112; Mold., Fedde Repert. Sp. Nov. Reg. Veg. 40 (1936) 109; Résumé Verbenac. etc. (1959) 242, pro syn.; Prain, Beng. Pl. 2, rep. edn (1963) 618; Beard (ed.), W. Aust. Pl. edn 1 (1965) 91; Burkill, Dict. Econ. Prod. Malay Penin. 1 (1966) 407; Mold., Fifth Summary Verbenac. etc. 1 (1971) 406, pro syn.; Green, Cens. Vasc. Pl. West. Aust. (1981) 89.

Type: J.G. König s.n., East Indies, Java (n.v.). Not on the microfiche of Linnaean Herbarium at LINN or S.

C. tomentosa (L.) Lam. auct. non L.: Lam., Encycl. Meth. Bot. 1 (1783) 562 p.p. excl. basionym *Tomex tomentosa* L.; Vahl, Symb. Bot. Pl. 3 (1794) 12; Raeusch., Nomencl. Bot. edn 3 (1797) 37.

C. americana auct. non L.: Lour., Fl. Cochinch. edn 1, 1 (1790) 70; Vahl, Symb. Bot. Pl. 3 (1794) 12.

C. macrocarpa Raeusch., Nomencl. Bot. edn 3 (1797) 37, nom. nud.

Type: "Ind. Orient" (n.v.).

C. bicolor auct. non Juss.: Schau. in DC., Prod. 11 (1847) 642 (quoad Cuming pl. exs. n. 1283); Miq., Fl. Ind. Bat. 2 (1858) 889; Merr., Phil. J. Sc. Bot. 1, Suppl. 1 (1906) 121.

C. adenantha R. Br., Prod. Fl. Nov. Holl. (1810) 513; Roem. & Schult., Syst. Veg. 3 (1818) 98; Spreng., Syst. Veg. 1 (1825) 420; Walp., Rep. Bot. Syst. 4 (1845) 129.

Type: *R. Brown* s.n., Queensland, 1802-05 (BM, K—syntypes!).

C. heynii Roth in Roem. & Schult., Syst. Veg. 3 (1818) 96; Roth, Nov. Pl. Sp. (1821) 82; Blume, Bijdr. Fl. Ned. Ind. (1826) 819; Spreng., Syst. Veg. 1 (1825) 420; Roem. & Schult., Linn. Mant. 3 (1827) 53; Span., Linnaea 15 (1841) 330; Walp., Rep., Bot. Syst. 4 (1845) 128; Zoll. & Mor., Syst. Verz. Zoll. (1846) 53.

Type: *B. Heyne* s.n., "In India Orientali", undated (n.v.).

C. dentata auct. non Roth: Roxb., Wall. Cat. (1829) No. 1834, p.p.

C. rheedii Kostel., Alleg. Med.-Pharm. Fl. 3 (1834) 829.

Type: *Rheed* s.n., Malabar, India.—(n.v.)

C. latifolia Zippel ex Span., Linnaea 15 (1841) 330, nom. nud., Pro syn.

C. sumatrana Miq., Fl. Ind. Bat. 2 (1858) 886, basionym of *C. cana* L. var. *sumatrana* (Miq.) H.J. Lam and *C. candicans* (Burm. f.) Hochr. var. *sumatrana* (Miq.) Moldenke.

Type: *Teyzman* s.n., Sumatra, in Padang, langs de wegen,—(n.v.).

C. longifolia auct. non Lam.: Miq., Fl. Ind. Bat. 2 (1858) 887 p.p. quoad syn. *C. adenantha* R. Br.

C. cana L. var. *typica* H.J. Lam, Verbenac. Malay. Arch. (1919) 70.

Type: *Elbert* 20467 & *Forbes* 1252, Java,—(n.v.). Collections by others from different localities were also cited.

C. cana L. var. *sumatrana* (Miq.) H.J. Lam, loc. cit. p. 71.

Type: As for *C. sumatrana* Miq.

C. cana L. var. *longifolia* H.J. Lam, loc. cit. p. 72.

Type: *Gorontalo* s.n., Herb. L. no. 908. 266-1231 & 1232, Celebes, 18.x.1911 (n.v.). Syntypes from the Philippines by *Reillo* 19265, *Raymundus* 189 and *Ledermann* 14126 were also cited.

C. cana L. var. *latifolia* H.J. Lam f. *typica* H.J. Lam, loc. cit. 72.

Type: *Elbert* 736 & 1992, Mt Rindjani, Lombok, Feb. & April 1909 (n.v.). Five more collections by others from different localities were cited with the protologue.

C. cana L. var. *latifolia* H.J. Lam, f. *pentamera* H.J. Lam, loc. cit. p. 73.

Type: Herb. L nos. 908. 265-1108 and 1445 (n.v.). These two specimens are without name of collector or locality.

C. cana L. var. *dentata* H.J. Lam, loc. cit. p. 73.

Type: *Elbert* 3505, Sumbawa, 3.xii.1909 (n.v., syntype). *Zippel* s.n., sub Herb. L no. 908. 266-13 (n.v. syntype).

C. cana L. var. *integrifolia* H.J. Lam, f. *typica* H.J. Lam, loc. cit. p. 74.

Type: *Kraemer* 36 & *Volkens* 210, Caroline Island, 16.xii.1899 (n.v.). Four more collections by others from different localities were cited with the protologue.

C. cana L. var. *integrifolia* H.J. Lam f. *glabriuscula* H.J. Lam, loc. cit. p. 74.

Type: *Weber* s.n., sub Herb. L no. 908. 267-916, Saleyer Island,—(n.v.). Two other collections were also cited with the above syntype.

C. candicans (Burm. f.) Hochr. var. *sumatrana* (Miq.) Mold. Phytologia?; Résumé Verbenac etc. (1959) 247.

Type: As for *C. sumatrana* Miq.

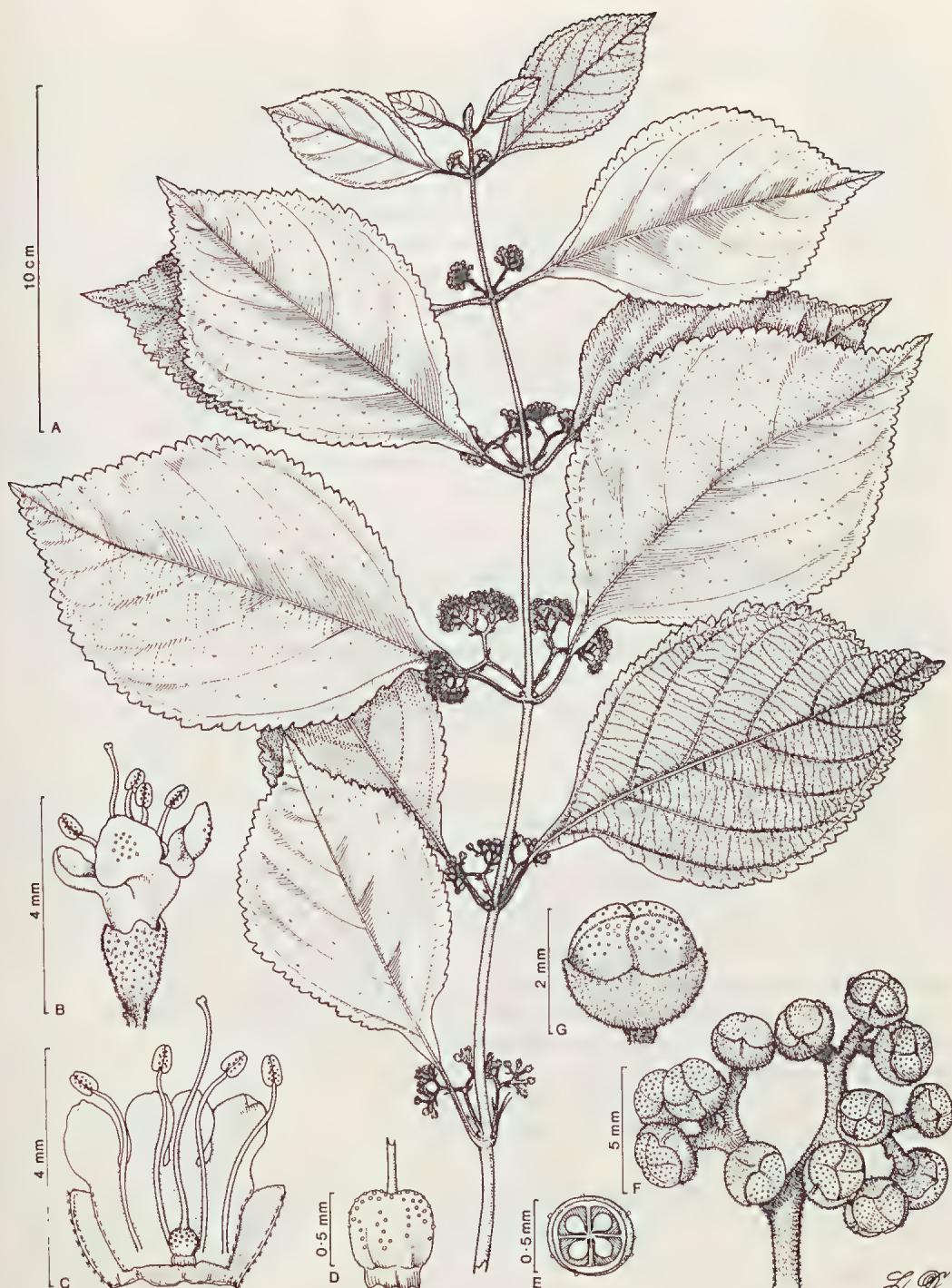


Fig. 4. *Callicarpa candicans* (Burm. f.) Hochr. (A-E, N. Byrnes 1235: BRI; F-G, C. Dunlop 3115: DNA). A, flowering branch; B, flower; C, flower vertically cut open to show androecium and gynoecium; D, ovary; E, transverse section of ovary; F, infructescence; G, fruit with persistent calyx.

Description (Fig. 4)

A shrub or small tree 1-4 (-6) m tall. *Stem* (young) and branches greyish-brown-tomentose. *Leaves*: lamina very variable in form, elliptic-oblong, lanceolate, ovate-lanceolate or ovate-rotundate, cuneate towards the base, shortly acuminate at the apex, serrate-dentate along the margins, (7-) 10-20 cm long, (2.5-) 4-9 (-11) cm broad, glandular and densely greyish-white- or yellowish-grey stellate-tomentose beneath, stellate-pubescent above when young, later glabrous except on the nerves; petiole stellate-tomentose, 0.6-3 (-4) cm long. *Inflorescence* stellate-tomentose; primary peduncles shorter than the petioles, 0.5-1 cm long. *Flowers* sub-sessile, 4-merous. *Calyx* minutely 4-toothed or almost truncate, glandular and stellate-hairy outside, glabrous inside, 1-1.5 mm long, \pm 1 mm in diameter at the top. *Corolla* mauve or violet, glabrous, with a few glands on the back of each lobes, 3-3.5 mm long; lobes broadly ovate or almost orbicular, obtuse, 1-1.5 mm long, nearly as broad at the base; tube \pm 2 mm long, 1 mm in diameter at the top. *Stamens* exserted; filaments 4-5 mm long; anthers oblong, glandular on the back along the connective, \pm 1 mm long, 0.5 mm broad. *Ovary* globose, glabrous, glandular all over, \pm 0.5 mm in diameter; style exserted, glabrous, 5-6 mm long, stigma capitate. *Fruit* a depressed-globular almost succulent drupe, mauve, purple, or deep dark red, glabrous, glandular, \pm 2 mm in diameter.

Representative specimens collections seen: Australian 59, non-Australian 25).

AUSTRALIA: QUEENSLAND: *Armit* 477, Sutherland Creek, undated (MEL 97701); *Brass* 280, Settlement Creek, Feb. 1923 (BRI, CANB, NSW); *Byrnes* 3201, Lizard Island, 8.v.1975 (BRI); *Cameron* 20137, Prince of Wales Island, 13.ii.1975 (QRS 2 spec.); *Dallachy* s.n., Port Denison, — (MEL 97614-5); *Hubbard & Winders* 6736, Chillagoe, 22.i.1931 (BRI, K); *Hyland* 9934, Jervoise Holding, 18° 54' S, 144° 43' E, 31.v.1979 (QRS); *Persieh* 693, Endeavour River, 1882 (MEL); *Webb & Tracy* 10177, 6.4 km N of Mungana, 31.v.1970 (BRI); *K.J. White* 1174, Cape York, 11° 00' S, 142° 00' E, Nov. 1955 (BRI).

NORTHERN TERRITORY: *Byrnes* 1235, Green Ant Creek, East Spring, 13° 32' S, 131° 14' E, 18.xii.1968 (BRI, NT); *Craven* 3556, McArthur River area, 16° 27' S, 136° 10' E, 31.i.1976 (A, CANB, L, NT); *Dunlop* 3115, Wagait Reserve, 13° 12' S, 130° 40' E, 16.i.1973 (BRI, CANB, DNA, K, MO, NT); *F. Mueller* s.n., Victoria River, May, 1856 (MEL 97610).

WESTERN AUSTRALIA: *Easton* 1008, near Artesian Range, Sept. 1923 (PERTH); *Fitzgerald* 616, Devil's Pass, Napier Range, May, 1905 (PERTH); *Fitzgerald* s.n., May River, May, 1905 (NSW); *Froggat* 40, King Sound, Derby, 1887 (MEL 97609).

NEW GUINEA: *Bradke* 232 & 376, Duke of Yorke Islands, July, 1917 (BRI); *Coode & Katik NGF* 40110, Karu, Kaving subdistrict, New Ireland, 03° 29' S, 152° 14' E, 12.i.1969 (BRI, LAE, A, BOG, CANB, K, L); *Henty & Frodin NGF* 27280, Arawe, Kandrian subdistrict, New Britain, 06° 10' S, 149° 03' E, 20.iii.1966 (BRI, A, CANB, K, L, LAE, NY); *Wiakabu & Kauning LAE* 73313, PNG & W. Irian border near Vanimo, 02° 37' S, 141° 00' E, 19.ix.1977 (BRI, A, CANB, E, K, L, LAE, UPNG).

TIMOR: *Kooy* 328, South Central Area, Noetako (Amantun), 29.i.1966 (BRI, L).

JAVA: *Koorders* 21928, Banjumas, 2.i.1896 (BRI, BOG); *Meer* s.n., Bay of Djakarta, 20.v.1957 (CANB, L).

KALIMANTAN: *Teysmann* s.n., "Tiga nemin, Lampongs", — (MEL 97757).

SUMATRA: *Junghuhn* 5, Padang, undated (L).

PHILIPPINES: *Cuming* 1283, Philippine Isl., — (MEL 97754).

VIETNAM: *Squires* 188, near Hue, Jan.-May, 1927 (MEL).

GUAM: *Shmull* 7, Yona, 31.i.1962 (L).

HAINAN: *Hai Ngan & Lei* 155, Mei Maan, Ching Mai district, 21.x.1932 (L).

INDIA: *Hooker* s.n., Ind. Orient, loc. incert., 1830 (MEL 97756).

Distribution (Map 4)

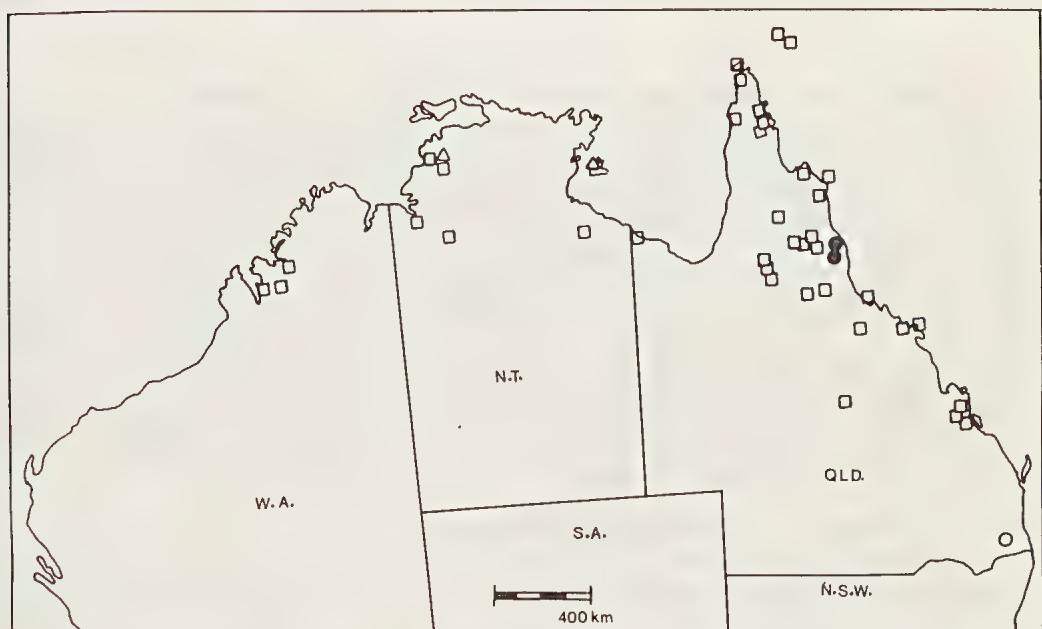
C. candicans is widely distributed in tropical areas of Queensland, Northern Territory and Western Australia. In Queensland it grows in the coastal areas from Rockhampton northwards to the tip of Cape York Peninsula. It has also been recorded from several off-shore Islands of the State. In the Northern Territory, one locality is

along the McArthur River near the Gulf of Carpentaria and all the rest to the south-west of Darwin between Daly River and Victoria River. It is very likely that this species may also occur in Arnhem Land, but so far we have no record from that area. The Western Australian localities are in the south-western part of the Kimberlies where it has been recorded from north-east of Broome near King Sound and Collier Bay. Further exploration may reveal its presence in other parts of the Kimberley region.

Collections from overseas have been examined from Eastern India, Vietnam, Hainan, Guam and most parts of Malesia. Lam (1919) recorded it in several parts of Malesia except Borneo and New Guinea. According to Moldenke (1971), this species also occurs in Southern China, Laos and Thailand.

Comments

A range of leaf shape and density of hairs on the lamina has been observed within this species. There is also variation, even in one collection, in petiole-length and in the number of secondary veins. It is, therefore, necessary to examine a range of collections from different localities to establish the general shape and leaf-size. The young leaves are generally densely hairy all over, but in mature leaves the hairs on the adaxial surface gradually diminish and the lamina often becomes almost glabrous. Such changes are also noticed in several other *Callicarpa* species but they are apparently more pronounced in *C. candicans*. Lam (1919) seems to have accepted slight differences in leaf-shape, size and length of petiole as stable characters and on this basis he created six varieties and four forms within this species. These forms are so inconsistent and merge into each other so gradually that no purpose is served in retaining them. During present investigations, all of these infraspecific taxa have been found identical with the typical variety, and have, therefore, been placed in synonymy.



Map 4. *C. brevistyla* Δ ; *C. candicans* \square ; *C. macrophylla* \circ ; *C. caudata* \bullet

Charles O. Frake's collection no. PNH 36163 (CANB) from Mindanao has been identified as this species. Amongst all the available *Callicarpa* specimens, this collection seems nearest to *C. candicans* but differs in having much longer pedicels, filaments and style, and oblong-elliptic leaves.

In the protologue of *C. cana* the type locality is given: "Habitat in Java", but there is no mention of collector's name. According to Moldenke (1936), however, "the type of this Old World species was collected by J.G. König in eastern India". During present studies, the type was not found on the microfiche of Linnaean herbarium at LINN or S.

Lam's var. *latifolia* f. *pentamera* has been erroneously recorded by Moldenke (1959, 1971) as "var. *latifolia* f. *pentandra*".

According to Burkhill (1966), "the tender leaves are boiled and the decoction is drunk for abdominal troubles In Java a decoction is used for bringing on menses, and the leaves are used for poulticing wounds and boils It is one of the species used in the Philippines Islands for stupifying fish; yet after drying, it is also a bait for prawns".

In the National Herbarium of Victoria, one of Armit's collection (MEL 97701) has a locality and the collection no. "477" and the other (MEL 97618) only the year of collection "1884". In view of great similarity between the two specimens, it seems probable that both specimens belong to the same collection.

Affinities

C. candicans is closely allied to *C. brevistyla*, *C. longifolia* and *C. macrophylla*. For details see "affinities" under these species.

According to Moldenke (1936), this species has been "most frequently (especially in old works) compared with *C. lanata* L. and *C. americana* L., it seems instead to be most closely related to *C. erioclona* Schau".

5. *Callicarpa macrophylla* Vahl, Symb. Bot. Pl. 3 (1794) 13, t. 53.

Raeusch., Nom. Bot. edn 3 (1797) 37; Willd., Linn. Sp. Pl. 1 (1798) 620; Roem. & Schult., Syst. Veg. 3 (1818) 94; Roxb., Fl. Ind. 1 (1820) 408; Spreng., Syst. Veg. 1 (1825) 420; Roem. & Schult., Linn. Mant. 3 (1827) 53; Walp., Rep. Bot. Syst. 4 (1845) 127; Schau. in DC., Prod. 11 (1847) 644; Benth. in Hook., J. Bot. & Kew Gard. Misc. 5 (1853) 135; Benth., Fl. Hongk. (1861) 270; Brandis, For. Fl. NW. & Centr. Ind. (1874) 368; Kurz, For. Fl. Br. Burma 2 (1877) 274; Gamble, Man. Ind. Timb. edn 1 (1881) 282-83 & 503; C.B. Clarke in Hook. f., Fl. Br. Ind. 4 (1885) 568, excl. var. *griffithii* & var. *sinensis*; Maxim., Bull. Acad. Sc. St. Petersb. 31 (1887) 75; Maxim. in Mel. Biol. 12 (1888) 505; K. Schum., Bot. Jahrb. 9 (1888) 220; K. Schum. & Hollr., Fl. Kais. Wilh. Land (1889) 118; Forb. & Hemsl., J. Linn. Soc. (Bot.) 26 (1890) 254; Warb., Bot. Jahrb. 13 (1891) 426; K. Schum. & Lauterb., Fl. D. Südsee (1901) 522; Collett, Fl. Siml., rep. edn (1921) 380; B. Leeuwen, Faber & Smith, Bull. Jard. Bot. Ser. 3, 4 (1922) 284; Junell, Symb. Bot. Ups. 4 (1934) 81, 82, fig. 132; Mold., Fedde Repert. Sp. Nov. Reg. Veg. 40 (1936) 104; Parker, For. Fl. Punjab edn 3 (1956) 393; Dakkus, List Pl. Cult. Hort. Bot. Bog. edn 2 (1957) 42; Mold., Résumé Verbenac. etc. (1959) 155, 157-160, 165, 168, 174, 177, 200, 242-43, 245, 247; Haines, Bot. Bihar & Orissa 2, rep. edn (1961) 744; Prain, Beng. Pl. 2, rep. edn (1963) 618; C. Back. & Bakh. f., Fl. Java 2 (1965) 601; Mold., Fifth Summary Verbenac. etc. 1 & 2 (1971) 267, 269-72, 282, 286, 293-94, 335, 405-08, 410, 417-19; Phytologia 21 (1971) 214, 336, 376; Stewart, Ann. Cat. Vas. Pl. W. Pak & Kash. (1972) 605, fig. 2, F-H; Jafri & Ghafoor, Fl. W. Pak. no. 77 (1974) 20.

Type: J.G. König s.n., Eastern India,—(C, microfiche!).

C. incana Roxb., Fl. Ind. 1 (1820) 407.

Type: Roxburgh s.n., Bengal, India,—(K).

C. roxburghii Wall., Cat. (1829) no. 1833, nom. nud., Walp., Rep. Bot. Syst. 4 (1845) 127; Schau. in DC., Prod. 11 (1847) 640.

Type: N. Wallich 1833, Bengal, India,—(K).

C. cana auct. non L.: Gamble, Darj. Pl. List (1878) 60; Man. Ind. Timb. (1881) 283.

C. dunniana Lev., Fedde Report. Sp. Nov. Reg. Veg. 9 (1911) 456.

Type: *J. Seguin* 2439, Hoang-Ko-Chou, 20.vi.1898 (n.v.); *Jos. Esquirol* 869, Long-chan, June, 1960 (n.v.).

Description (Fig. 5)

A shrub or small tree 3-5 mm high. *Stem* and branches densely covered with a greyish tomentum of stellate hairs. *Leaves*: lamina ovate or narrowly elliptic to oblong-lanceolate, acuminate, cuneate, obtuse or rounded at the base, crenate-serrate or crenate-dentate, 10-35 cm long, 2-18 cm broad, mature glabrescent and rugose above or with very numerous stubble-like small hairs, densely greyish-white stellate-tomentose beneath; petiole 1-2 (-2.5) cm long, densely floccose-tomentose. *Inflorescence* densely stellate-hairy; primary peduncles equal to or a little longer than the petioles, 1-2.5 (-3) cm long. *Flowers* on short slender pedicels; pedicel gland-dotted, tomentose, \pm 1 mm long. *Calyx* minutely 4-denticulate, 1-1.5 mm long, glandular outside, with coarse stellate-hairs at the base, glabrous inside. *Corolla* violet or lilac, thinly hairy or almost glabrous with yellow glandular dots outside, glabrous inside, 2.5-3.5 mm long; lobes 1-1.5 mm long, obtuse or rounded; tube 2-2.5 mm long. *Stamens* exserted, inserted near the base of the corolla-tube; filaments 4-6 mm long; anthers oblong, \pm 0.7 mm long, 0.4-0.5 mm broad, glandular along the connective. *Ovary* globose, glabrous, densely glandular, 0.5-1 mm in diameter; style exserted, glabrous, 5-8 mm long, stigma capitate. *Fruit* globular, \pm 2 mm in diameter, glabrous, glandular, smooth, white.

Specimens examined

AUSTRALIA: QUEENSLAND: *Eaves* s.n., Bremer River, undated (MEL 97743).

NEW GUINEA: ?*Bradke* 298, Duke of York Island, undated (BRI).

BURMA: *McKee* 6006, Hsenwi, 7.i.1958 (CANB); *McKee* 6193, Nyaungshwe, 13.v.1958 (CANB).

INDIA: *Falconer* 748, loc. incert., Herb. East. Ind. Co., distributed 1869 (K, L).

Distribution (Map 4)

The first and the only Australian record of *C. macrophylla* is made here from south-east of Brisbane in Queensland. Moldenke (1971) recorded it from the Mascarene Islands, Bangladesh, Nepal, India, Southern China, Hong Kong, Burma, Thailand, West Irian and Papua New Guinea. So far, its presence in Malaysia, the Philippines, Timor and all parts of Indonesia (excepting West Irian) is unknown. According to Backer & Bakhuizen (1965), it is "cultivated as an ornamental" in Java. Moldenke (1971) listed it as cultivated in Argentina, Belgium, Brazil, California in the U.S.A. and Cuba. From outside Australia, the present author has seen reliably identified collections only from Burma and India.

In the case of the single specimen from Queensland it could not be ascertained whether the plant occurs there naturally or whether the material was obtained from a cultivated tree.

Comments

Moldenke's (1971) record from the Mascarene Islands is not only without any locality but away from the main distribution area of this species. It seems that he probably saw a specimen from cultivation introduced as an ornamental. In "Hortus Mauritianus", Bojer (1837) recorded it as "Pat Inde orientale. Cult au jardin du Roi, Pampl. Arbrisseau. Fl. Mars, Mai". According to Moldenke "this species is native from China southward into Nepal, Bhutan, India, Burma, and Hong Kong, and east to New Guinea. It has been introduced in Reunion and Madagascar and is widely cultivated

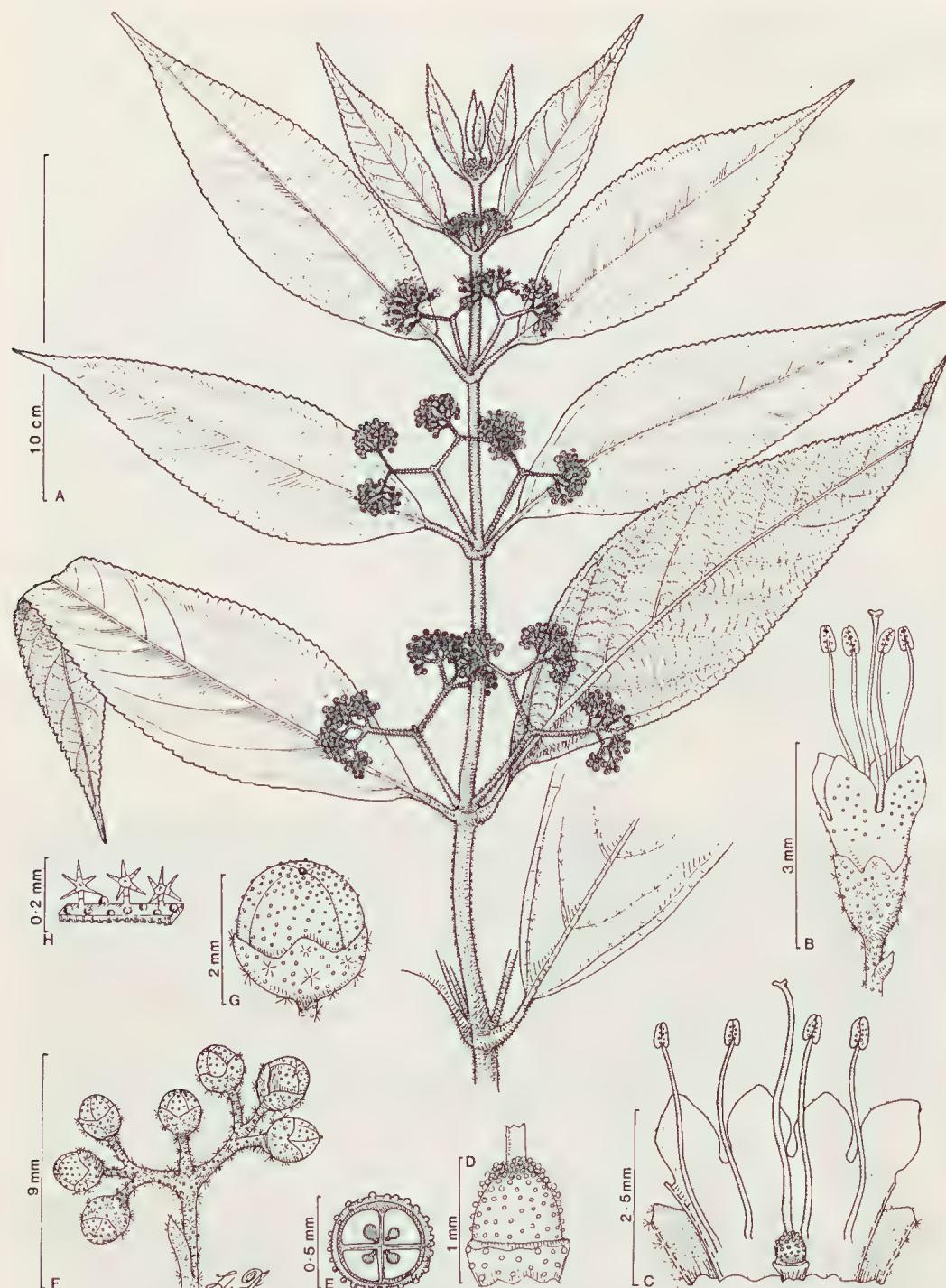


Fig. 5. *Callicarpa macrophylla* Vahl (A & F-H, Eaves s.n.: MEL 97743; B-E, M.S. McKee 6193: CANB). A, flowering branch; B, flower; C, flower vertically cut open to show androecium and gynoecium; D, ovary; E, transverse section of ovary; F, infructescence; G, fruit with persistent calyx; H, calyx-hairs.

elsewhere". According to Forbes & Hemsley (1890) it is "widely spread in Northern and Eastern India".

The corolla-colour is described as pink, red, purple, purplish-pink, blue, violet or reddish-purple, depending upon the interpretation and definition of colour by different collectors.

According to some Indian authors, it is "cultivated as a hedge plant in gardens, and the seed-paste being used by some for mouth ulcers in Uttar Pradesh". It is also said to be "used in the preparation of a medicine used for injuries" in Kwangsi, China, and in Hazara, Pakistan "the heated leaves are used to cure the rheumatic pains".

Affinities

Amongst all Australian *Callicarpa*, *C. macrophylla* seems nearest to *C. candicans* in its stem and inflorescence being stellate-tomentose; leaves densely greyish-white tomentose underneath; corolla mauve or lilac, glabrous; ovary glabrous and glandular all over. However, *C. macrophylla* may easily be distinguished by its lamina being obtuse or rounded at the base; peduncles a little longer than the petioles, and fresh mature fruit of white colour. The lamina in *C. candicans* is cuneate towards the base and the fresh mature fruit of purple colour. *C. macrophylla* is also close to *C. caudata* in having its lamina obtuse or rounded at the base; peduncles longer than the petioles and corolla violet and glabrous. The latter, however, differs in its stem and peduncle being covered chiefly with simple septate hairs; lamina elongated towards the apex into a caudate tip, ferruginous tomentose underneath, and fruit "pink" coloured.

6. ***Callicarpa caudata* Maxim.**, Bull. Acad. Sc. St. Petersb. 31 (1887) 76; Maxim. in Mel. Biol. 12 (?1888) 506; Merr., Philip. J. Sc. (Bot.) 2 (1907) 299; Elm., Leafl. Philip. Bot. 3 (1910) 862; Merr. & Merritt, Philip. J. Sc. (Bot.) 5 (1910) 380; H.J. Lam, Verbenac. Malay. Arch. (1919) 59; Merr., Enum. Philip. Fl. Pl. 3 (1923) 283; White, Proc. Roy. Soc. Qld 34 (1923) 50; Elm., Leafl. Philip. Bot. 10 (1939) 3860; Mold., Résumé Verbenac. etc. (1959) 168, 182, 194, 197, 198, 200, 242; Phytologia 14 (1966) 144; Phytologia 21 (1971) 33, 108, 225, 233-35, 240, 332; Fifth Summary Verbenac. etc. 1 & 2 (1971) 314, 321, 329, 331, 335, 339, 406-07, 414.

Type: *Cuming 1095*, Philippines,—(n.v.). Probably in Herb. PNH.

C. caudata Maxim. var. *magna* H.J. Lam, Verbenac. Malay. Arch. (1919) 60.

Type: *Elmer 11333*, Todaya (Mt Apo), Davao, Mindanao, Philippines, Aug. 1909 (n.v.).

C. pedunculata auct. non R. Br.: Beer & H.J. Lam, Blumea 2 (1936) 222 (quoad spec. *L.J. Brass 5520*).

Description (Fig. 6)

A branched shrub to 4 m tall. *Stem* and branches glandular, densely clothed with whitish-yellow or ferruginous tomentum of simple septate hairs. *Leaves*: lamina narrowly lanceolate, rounded, truncate or cordulate at the base, long tapering caudate towards the apex, membranous, dentate, 8.5-20.5 cm long, (2-) 3-5 (-6) cm broad, reddish-yellow glands on both surfaces, pubescent above with simple septate hairs, densely tomentose beneath with ferruginous stellate-dendriform hairs, sometimes intermixed with simple hairs; petiole 0.3-1.5 cm, glandular and floccose-tomentose with ferruginous simple hairs. *Inflorescence* ferruginous-tomentose; primary peduncles longer than the petioles, tomentose, 0.5-2 (-2.5) cm long. *Flowers* pedicellate; pedicels \pm 1 mm long, glandular and tomentose. *Calyx* cup-shaped, minutely 4-toothed, glandular and with long simple hairs outside, glabrous inside, 1-1.5 mm long, \pm 1 mm in diameter

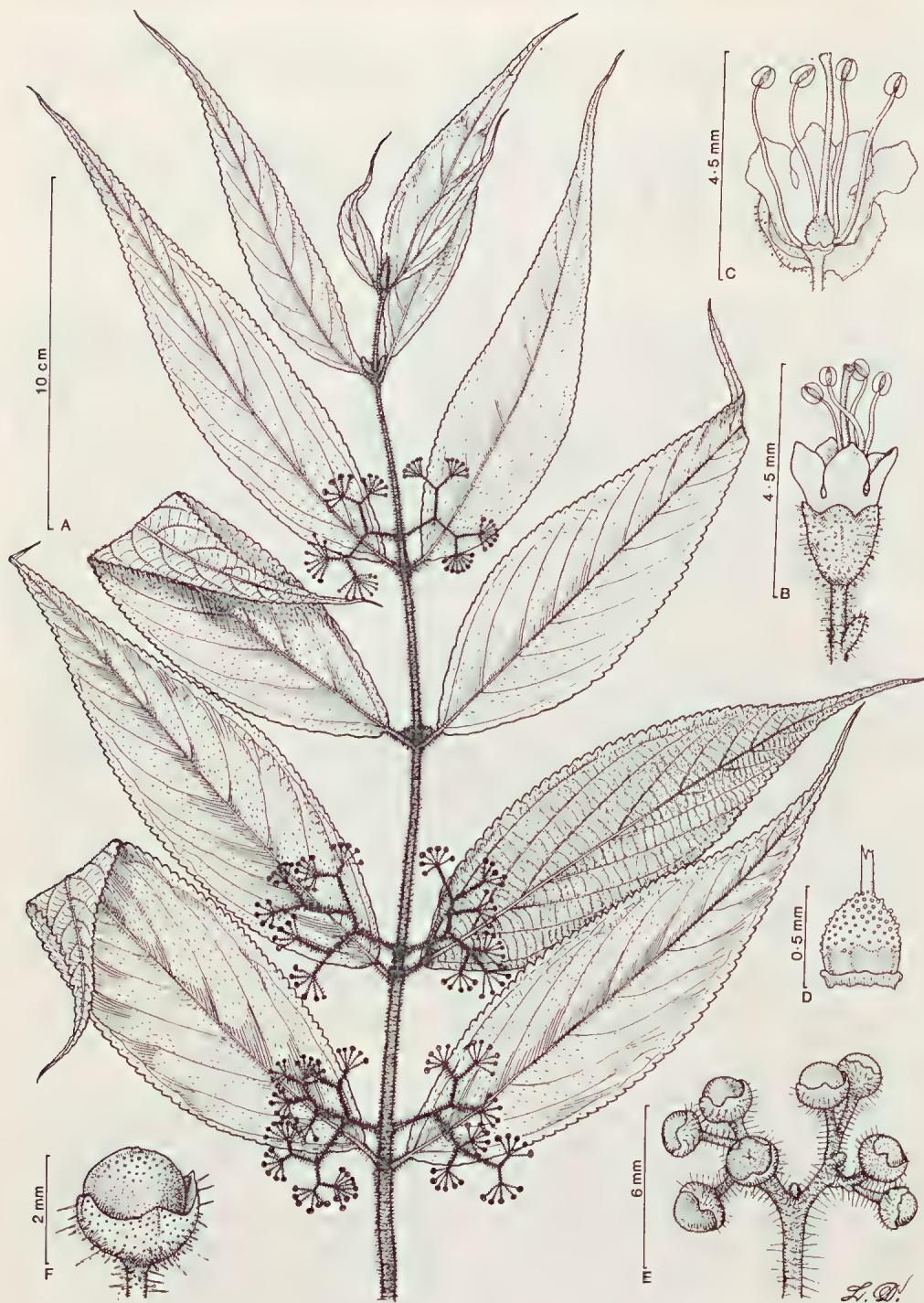


Fig. 6. *Callicarpa caudata* Maxim. (A-F, V.K. Moriarty 2538: QRS). A, flowering twig; B, flower; C, flower vertically cut open to show androecium and gynoecium; D, ovary; E, infructescence; F, fruit with persistent calyx.

distally. *Corolla* mauve, glabrous all over, \pm 2 mm long; lobes broadly ovate or almost orbicular, obtuse, \pm 1 mm long; tube dilated upwards, \pm 1 mm long, about the same in diameter at the top. *Stamens* exserted, inserted near the base of the corolla-tube; filaments 3-3.5 mm long; anthers glandular along the connective, \pm 0.5 mm long. *Ovary* globose, glandular all over \pm 0.5 mm in diameter; style exserted, filiform, glabrous, \pm 4 mm long, stigma knobby or capitate. *Fruit* globular, glabrous, glandular, "pink", \pm 2 mm in diameter.

Specimens examined (collections seen: Australian 3, non-Australian 32)

AUSTRALIA: QUEENSLAND: *Berthoud* s.n., Johnstone River, northern Queensland, Dec. 1882 (MEL 97700). *Bancroft* s.n., loc. cit., Cook district, (BRI 261552). *Moriarty* 2538, S.F. 675, 9 km WSW of Gordonvale, 25.xi.1978 (QRS).

NEW GUINEA: *Barker* LAE 67711, Telefomin subdist., West Sepik Dist., Busilmin airstrip, Lat. 5° 00' S, Long. 141° 05' E, 5.v.1975 (BRI, LAE, A, CANB, E, K, L); *Brass* 5520, Mafulu, Central Division, Sept.-Nov., 1933 (BRI, NY); *Brass* 31563, Mt Michael, Eastern Highlands, 12.ix.1959 (CANB, NY); *Carr* 13163, Boridi, Papua, 15.ix.1935 (CANB 2 spec.); *Christensen* W142, Manin Valley, Hagen subdist. Western Highlands, 05° 45' S, 144° 20' E, 21.xi.1973 (BRI, LAE, L); *Clarke* ANU 9508, Tsuwenkai, Jimmi, West Highlands, 05° 30' S, 144° 45' E, 18.ii.1970 (CANB 2 spec.); *Hartley* 12051, 6.4 km SE of Sassaure, Eastern Highlands, 146° 00' E, 06° 24' S, 17.vii.1963 (BRI, CANB); *Hartley* 13039, between Kuputivava and Omoretu, Goilala subdistrict, Papua, 13.ii.1964 (BRI, CANB); *Hoogland* & *Pullen* 5328, Minuma village, upper Asaro Valley, Goroka subdistrict, 15.vi.1956 (BRI, CANB, LAE, MEL, A, BM, BO, BISH, G, K, PNH, US); *Kanis* 1203, E of Opanabu village, along Suono River, \pm 149° 42' E, 10° 01' S, 11.vii.1969 (CANB, 2 spec., LAE, A, L, K); *Millar* 17543, Zatarl, SE of Boana, 06° 25' S, 146° 60' E, 27.ii.1963 (BRI, CANB, LAE); *Pajmans* 1348, 2 km S of Kundiawa, Chimbu District, 20.iv.1971 (CANB); *Pajmans* 1398, 25 km E of Minj, Kerowagi subdistrict, 27.iv.1971 (CANB); *Pullen* 8048, Bonenau village, Baniara subdistrict, 18.viii.1969 (CANB, 2 spec. LAE, L). *Robbins* 2892, Lai Valley, near Wapenamanda, Western Highlands, 6.vii.1960 (CANB); *Sayers* N.G.F. 21499, Moro, Saidor subdist., 25.xi.1964 (BM, CANB, L); *Schodde* 1353, above Kiburu, Mendi Valley, Southern Highland, Papua, 28.vi.1961 (BRI, CANB 2 spec., A, BM, L, LAE); *Schodde* 4785, ca 1.6 km E of Aselei, Morobe district, 2.iv.1966 (A, CANB 2 spec., K, L, LAE); *Versiegh* B.W.3056, Biak, Arupa, Wessel Lake Region, 23.iii.1955 (CANB); *Vink* 16438, Nona River, Kubor Range, W.A., 29.viii.1963 (CANB, L); *Wheeler* ANU 6230, 16 km SE of Hagen, W.H. July, 1966 (CANB 2 spec., LAE); *White* 455, Mafulu, July-Aug., 1918 (BRI); *Womersley* 4323, Nondugl, W.H., April, 1951 (BRI, CANB, LAE).

SOLOMON ISLANDS: *Kajewski* 2420, Guadalcanal Island, Berande River, Bau, 7.i.1930 (BRI).

PHILIPPINES: *Merrill* 1727, Benguet subprovince, Luzon, May, 1914 (BRI, PNH); *Mendoza* 1099, Mayon Volcano, Albay Prov., Luzon, 29.v.1953 (L).

INDONESIA (Moluccas): *Beguin* 1229, Ternate Island, 17.xii.1920 (L).

Distribution (Map 4)

The first Australian records of *C. caudata* were collected from northern Queensland where it has been found south of Cairns. Lam (1919) recorded it only from the Philippines, but Moldenke (1959, 1971) gave its distribution from China, the Philippines, Celebes, Timor, Moluccan Islands, New Guinea and the Bismarck Archipelago. The present author has been able to confirm its occurrence only in the Philippines, Moluccan Islands, New Guinea and the Solomon Islands.

Comments

Lam (1919) described four varieties under this species, namely var. *magna*, var. *typica*, var. *glabriuscula* and var. *simplicipuberula*. Moldenke (1971) recognized two of these varieties viz.: var. *magna* and var. *typica* as convarietal with the typical variety *caudata* and transferred var. *glabriuscula* as a synonym under *C. dolichophylla* Merrill, and var. *simplicipuberula* under *C. merrillii* Moldenke. During present investigations, all Australian collections of *C. caudata* were found to belong to the typical variety.

Lam (1919) recorded its leaf-base as "acute", but in all the specimens examined the lamina is found to be almost always rounded or truncate but never acute at the base.

A specimen from Taiwan in the National Herbarium of Victoria (MEL 97774), identified as "*C. pilosissima* Maxim.", is found to have several characters in common with *C. caudata* Maxim. It has a similar indumentum on the stem, leaves and inflorescence; leaves about the same general shape with obtuse, rounded or truncate base and long tapering apex; peduncles longer than the petioles; corolla glabrous and ovary glabrous but glandular. If this specimen was correctly identified as *C. pilosissima* then this species should be regarded synonymous with *C. caudata*. Both these species were simultaneously described by Maximowicz (1887), one from the Philippines and the other from Formosa (Taiwan). The above opinion is based only on the available literature, as the present author has not been able to examine a sufficient range of material or their types which are likely to be preserved in the herbarium in Leningrad (LE) (Stafleu, 1976).

The septate hairs on peduncles, pedicels and outside the calyx are generally gland-tipped. In most cases, however, the glands fall off, probably during early stages and the hairs appear glutinous but without a distinct glandular tip.

Affinities

Of the Australian *Callicarpa* species, *C. caudata* is nearest to *C. pedunculata*. Both species have their leaves (lamina) rounded or truncate at the base, ferruginous-tomentose underneath; peduncle longer than the petiole; corolla violet, glabrous all over; ovary glabrous and glandular. However, *C. caudata* may easily be distinguished by its indumentum on stem, petioles and peduncles being mostly of simple septate hairs; leaves with long caudate apex and fruit pink. The hairs in *C. pedunculata* are stellate-dendriform, leaves tapering towards the apex but not caudate and fruit violet-purple. Outside Australia, *C. caudata* seems very close to *C. pilosissima* (see "Comments" above).

Merrill (1910) states that *C. caudata* is closely allied to *C. stenophylla* Merr., which differs "in its less dense and simply stellate, not plumose-stellate indumentum".

7. *Callicarpa pedunculata* R. Br., Prod. Fl. Nov. Holl. (1810) 513; Roem. & Schult., Syst. Veg. 3 (1818) 98; Roem. & Schult., Linn. Mant. Syst. Veg. 3 (1827) 55; Walp., Rep. Bot. Syst. 4 (1845) 127, pro syn. sub *C. lanata* Vahl; Schau. in DC., Prod. 11 (1847) 644, pro syn. sub *C. lanata* Vahl; Benth., Fl. Aust. 5 (1870) 57; F. Muell., Syst. Cens. Aust. Pl. 1 (1882) 103; Bail., Synop. Qld Fl. (1883) 377; Bail., Proc. Roy. Soc. Qld 1 (1884) 70; C.B. Clarke in Hook. f. (ed.), Fl. Br. Ind. 4 (1885) 569; F. Muell., Sec. Syst. Cens. Aust. Pl. 1 (1889) 173; K. Schum. & Hollr., Fl. Kais. Wilh. Land (1889) 119; Bail., Cat. Pl. Qld (1890) 35; Warb., Bot. Jahrb. 13 (1891) 426; Moore, Handb. Fl. N.S.W. (1893) 356; Bail., Qld Fl. 4 (1901) 1174; K. Schum. & Lauterb., Fl. D. Südsee (1901) 522; Britten, Ill. Aust. Pl. Banks & Soland. 2 (1901) 74, t. 237; Bail. in Meston (ed.), Exp. Bell.-Kerr, Parl. Rep. (1904) 14; King & Gamble, Mat. Fl. Mal. Penin. no. 21 (1909) 522; Bail., Comp. Cat. Qld Pl. (1913) 382; Maiden & Betche, Cens. N.S.W. Pl. (1916) 178; H.J. Lam., Verbenac. Mal. Arch. (1919) 55 exclud. syn. *C. lanata* Vahl; White, Proc. Roy. Soc. Qld 34 (1923) 50; Domin, Bibl. Bot. 89 (1929) 554; Mold., Fedde Repert. Sp. Nov. Reg. Veg. 40 (1936) 100; Dukkus, Pl. Cult. Hort. Bot. Bog. (1957) 42; Mold., Résumé Verbenac. etc. (1959) 208, 211, 242, 244-48, exclud. syn. *C. lanata* Vahl; Phytologia 21 (1971) 387; Fifth Summary Verbenac. etc. 1 & 2 (1971) 344, 349, 350, 407, 412, 415, 418-20, exclud. syn. *C. lanata* Vahl; Everist, Poison. Pl. Aust. (1974) 519; Jacobs & Pickard, Pl. N.S.W., Cens. Cycad. Conif. & Angiosp. (1981) 209.

Lectotype: R. Brown s.n., J.J. Bennett no. 2331, Coast of Northern Queensland, Australia, 1802-5 (BM, lectotype designated here!; E, K, MEL 97636, MEL 97637, NSW 145032—isolectotypes!).

C. cuspidata Roxb., Hort. Beng. (1814) 83 & Fl. Ind. 1 (1820) 409; Spreng., Syst. Veg. 1 (1825) 420; Roem. & Schult., Linn. Mant. Syst. Veg. 3 (1827) 54; Hassk., Cat. Pl. Hort. Bot. Bog. (1844) 136; Walp., Rep. Bot. Syst. 4 (1845) 128.

Type: *E. B. Heyne* s.n., eastern India, "a native of Moluccas", undated,—probably in Herb. K (n.v.).

C. dentata Roth in Roem., & Schult., Syst. Veg. 3 (1818) 98; Roth, Nov. Pl. Sp. (1821) 81; Blume, Bijdr. Fl. Ned. Ind. (1825) 818; Wall., Cat. (1832) no. 6319; Hassk., Cat. Pl. Hort. Bot. Bog. (1844) 136.

Type: *Heyne* s.n., eastern India (n.v.).

C. lanata auct. non L. nec. Vahl: Walp., Rep. Bot. Syst. 4 (1845) 127; Schau. in DC., Prod. 11 (1847) 644; Miq., Fl. Ind. Bat. 2 (1858) 886; F. Muell. in Laurie (ed.), Landsb. Explor. Aust. (1866) 119, quoad syn. *C. pedunculata* R. Br.

C. pedunculata R. Br. var. *typica* H.J. Lam, Verbenac. Malay. Arch. (1919) 56; Mold., Résumé Verbenac etc. (1959) 246, pro syn.; Fifth Summary Verbenac. etc. 1 (1971) 415, pro syn.

Type: *Karsten* 3059, Amboyna,—(n.v.). *Forsten* s.n., Amboyna, II.v.1842 (n.v.). *Lauterbach* 2449, River A, Camp 2, New Guinea, 3 vii.1896 (n.v.).

C. pedunculata R. Br. var. *glandulosa* H.J. Lam, Verbenac. Malay. Arch. (1919) 57; Mold., Résumé Verbenac. etc. (1959) 246, pro syn.; Fifth Summary Verbenac. etc. 1 (1971) 321, 335.

Type: *Forsten* s.n., Tondano, Celebes, May, 1840 (n.v.). *Hollrung* 210, Sattel Mountain, New Guinea, July, 1886 (n.v.).

C. pedunculata R. Br. var. *glabriuscula* H.J. Lam, Verbenac. Malay. Arch. (1919) 57; Mold., Résumé Verbenac. etc. (1959) 246, pro syn.; Fifth Summary Verbenac. etc. 1 (1971) 321, 329, 331, 356, 414.

Type: *Blume* s.n., Java,—(n.v.). *Hallier* 121, Key Islands,—(n.v.). *Elbert* 4503, Mongowe, near Saiwerang, Wetar, 19.ii.1910 (L!).

C. pedunculata R. Br. var. *psilocalyx* H.J. Lam, Verbenac. Malay. Arch. (1919) 57; Mold., Résumé Verbenac. etc. (1959) 246, pro syn.; Fifth Summary Verbenac. etc. 1 (1971) 335.

Type: *Nyman* 580, Saedel-Mountain, New Guinea, July, 1899 (n.v.); *Schultze* 194, Augusta River, New Guinea, Jan. 1913 (n.v.); *Schlechter* 16731, Hami Mountains, New Guinea, 27.x.1907 (n.v.).

C. viridis Domin, Bibl. Bot. 89 (1929) 554, fig. 179 p.p.; Mold., Résumé Verbenac. etc. (1959) 208; Fifth Summary Verbenac. etc. 1 (1971) 344, syn. nov.

Type: *Domin* 8117 & 8118, Harveys Creek, N. Queensland, Australia, Jan. 1910 (PR!).

Typification

C. pedunculata is based on R. Brown's collection (s.n.) from the east coast, Queensland, consisting of at least 6 duplicates, all of which remained in Robert Brown's possession until after his death. On his death, his herbarium went to the British Museum where the main set is still held. A complete and well preserved syntype of this species in Herb. BM, annotated by Robert Brown, and almost certainly used by him in preparing the original diagnosis of this species, is selected here as the lectotype. The lectotype and its duplicates bear J.J. Bennett's no. 2331.

Description (Fig. 7)

A shrub or small tree (2-) 3-4 (-6) m tall. *Stem* and branches densely clothed with yellowish-brown or ferruginous tomentum of stellate-dendriform hairs. *Leaves*: lamina ovate, ovate-lanceolate or oblong-ovate, with rounded, truncate or somewhat subcordate base, tapering towards the apex, serrate-dentate along the margins, (5-) 6-18 cm long, 3-6 (-8) cm wide across the middle, membranous, sparsely pubescent above with simple hairs, glandular and densely brownish-tomentose beneath with stellate-dendriform hairs; petiole densely dendriform-tomentose, 0.5-0.8 (-1.5) cm long. *Inflorescence* rather lax, sometimes inserted a little above the leaf-axil; primary peduncles slender, longer than the petiole, 0.8-1.8 (-2.7) cm long, densely tomentose. *Flowers* subsessile or

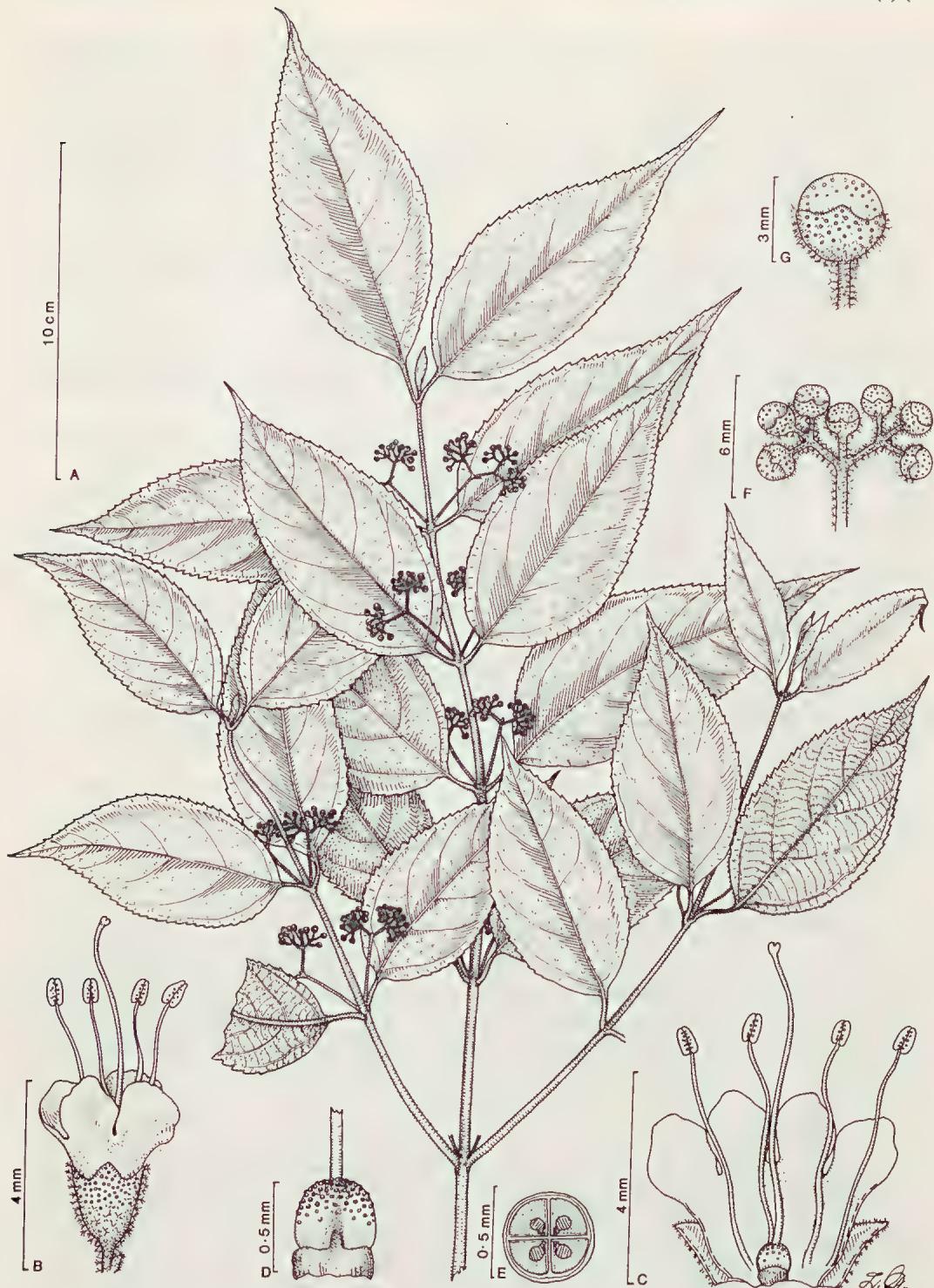


Fig. 7. *Callicarpa pedunculata* R. Br. (A, W.J.F. McDonald 3218: BRI; B-G, C. Fawcett s.n.: MEL 97651). A, fruiting branch; B, flower; C, flower vertically cut open to show androecium and gynoecium; D, ovary; E, transverse section of ovary; F, infructescence; G, fruit with persistent calyx.

shortly pedicellate pedicels 0.5-1 mm long. *Calyx* cup-shaped, minutely 4-toothed, densely glandular and stellate-dendriform hairy outside, glabrous within, 1-1.5 mm long, \pm 1 mm across top. *Corolla* purple or mauve, glabrous all over, (2-) 2.5-3 mm long; lobes almost orbicular in outline, \pm 1 mm long, nearly as broad; tube \pm cylindrical, slightly dilated towards the apex, 1.5-2 mm long, almost as broad at the top. *Stamens* exserted, inserted near the base of the corolla-tube; filaments equal, 4-6 mm long; anthers oblong, glandular along the connective, \pm 1 mm long, \pm 0.5 mm broad. *Ovary* globular, glabrous, glandular but more so at the top, 0.5-1 mm in diameter; style exserted, glabrous, 5-8 mm long, stigma capitate, slightly 2-fid. *Fruit* globular, almost succulent, glabrous, glandular chiefly at the top, whitish-mauve or violet-purple when ripe and fresh, 2-3.5 (-4) mm in diameter.

Representative specimens (collections seen: Australian 137, non-Australian 14)

AUSTRALIA: NEW SOUTH WALES: *Betche* 176, Lismore, March, 1891 (MEL); *Boorman* s.n., Coff's Harbour, May, 1909 (NSW 145043); *Coveny* 10551 & *Hind*, Toonumbar State Forest, 25.xii.1979 (BRI, NSW); *Fawcett* s.n., Richmond River,—(MEL 97650, MEL 97651, MEL 97654); *Floyd* 828, Long Gully near Drake, 17.i.1978 (NSW); *Forsyth* s.n., Byron Bay, Oct., 1898 (MEL 97639); *Maiden* & *Boorman* s.n., Brunswick River, Dec. 1903 (NSW 145037); *McLean* 54, Casino, April, 1918 (BRI, NSW); *Rupp* s.n., Camel Back Mt, Upper Clarence River, July, 1910 (MEL 97697); *Tomlins* s.n., Alstonville, "before 1917" (NSW 145041); *Vickery* 23857, Toolom Range, 17.iv.1953 (L, NSW); *Ward* L2, Lowanna, April, 1943 (SYD).

QUEENSLAND: *Bailey* s.n., Brisbane River, March, 1875 (BRI 261542); *R. Brown* s.n., East Coast, Queensland, 1802-5 (BM, lectotype!, E, K, MEL 97636-7, NSW 145032—isolectotypes!); *Cunningham* 82, Endeavour River, 1819 (MEL); *Dallachy* s.n., Rockingham Bay, 13.xi.1864 (MEL 97648); *Dietrich* 409, Rockhampton, Aug., 1865 (MEL 97716-7, PR); *Dietrich* 2525, Port Mackay,—(MEL 97710, PR); *Domin* 8106, Yarraba, Jan., 1910 (PR); *Domin* 8107 & 8108, Mt Tambourine, Jan., 1910 (PR); *F. Muell* s.n., Dawson River,—(MEL 97642); *Persieh* 197 & 278, Endeavour River, 1885 (MEL—2 spec.); *Sayer* 110, Russell River, 1886 (MEL 97739); *Webb* & *Tracy* 5617, end of Davies Creek, 23.i.1962 (BRI, CANB); *White* 1957, Mt Glorious, 6.v.1923 (NSW).

NEW GUINEA: *Conn* 116, Baiune River, Bulolo, 13.iii.1977 (LAE, A, BFC, CANB, K, L); *Henry* & *Streimann* NGF 38861, Baiyer River, Mt Hagen subdistr., 29.viii.1968 (BRI, A, CANB, K, L, BO); *Hoogland* 4246, 1 km E. of Guruguru, Tufi subdistr., 2.vii.1954 (BRI, CANB, A, BM, L, LAE); *Schlencker* s.n., Boku, Papua,—(BRI 261335); *Streimann* & *Kairo* NGF 39117, upper Baiune, Wau subdistr., 8.x.1968 (BRI, CANB, LAE, L); *Womersley* & *Floyd* 6806, Baiyer River, 26.xi.1954 (BRI, CANB, L).

INDONESIA: *Elbert* 4503, Mongowe near Saiwerang, Wetar, Moluccas, 19.ii.1910 (L—2 spec., syntype of *C. pedunculata* R. Br. var. *glabriuscula* H.J. Lam). *Forsten* s.n., Ambon, Moluccas, 14.iv.1842 (L—2 spec.).

TIMOR: *Forbes* 3601, Kupang, April-May, 1882 (L).

VIETNAM: *d'Alleizette* s.n., Quang Yen, Tonkin, Dec. 1908 (L).

Distribution (Map 3)

In Australia *C. pedunculata* has been found only in New South Wales and Queensland. The localities in New South Wales are in the far north-eastern part of the state where it mostly occurs in the area known as the "MacPherson—Macleay Overlap". In Queensland, the distribution is chiefly in the tropical region of the east-coast mainly in the area between Cooktown and eastern-most part of the northern border of New South Wales. So far, only a few inland collections have come to hand.

Collections from outside Australia have been examined from New Guinea, Timor, the Moluccas and Vietnam. Lam (1919) recorded this species from most parts of "Malesia" and tropical Australia, but Moldenke (1971) has noted several additional localities, namely Sikkim, Eastern India, Upper Burma, Southern China, Hong Kong, Taiwan, the Solomon Islands and New Zealand. He has also noted its occurrence on Lizard Island in the Great Barrier Reef, which has not been confirmed by any *Callicarpa* collection in Herb. BRI or other Australian herbaria. The New Zealand record may have come from cultivation because this genus is not known to occur wild in any part of that country. According to Moldenke (1971), *C. pedunculata* has been cultivated in France, the Hawaiian Islands, India and Java.

Comments

Lam (1919) distinguished four new varieties under this species, namely var. *typica*, var. *glandulosa*, var. *glabriuscula* and var. *psilocalyx*, differing chiefly on the shape of their leaves and density of indumentum on leaves and calyces. Moldenke (1959) regarded all these varieties as identical with the typical variety and thus recorded them all as synonyms of the typical form. Subsequently, however, Moldenke (1971) reinstated the vars *glandulosa*, *glabriuscula* and *psilocalyx* to their original status. During the present investigations, the characters on which Lam (1919) separated these varieties were found to be unstable. The leaf-shape and their size is found to be variable within specimens of the same collection. It also depends whether a collection came from a young or fully grown fruiting plant. The same is true with the indumentum on the leaves and calyces. Fully developed leaves are generally almost glabrescent on the adaxial surface, as are the mature calyces on the outside. These characters overlap so much within these varieties that it is not possible to draw a definite line of demarcation between these taxa. In view of this, following Moldenke (1959) all Lam's new varieties are regarded here as synonymous with the typical var. *pedunculata*.

Vahl (1794) described a collection in Herb. Herman as *Callicarpa lanata* and cited with it *Tomex tomentosa* L. (1748) and *C. lanata* L. (1771) showing that he was recording only Linnaeus' previously described species. The species name published by Vahl (1794), however, was erroneously taken by Walpers (1845), Schauer (1847) and Miquel (1858) as new. In their publications, it is recorded as "*C. lanata* Vahl" with *C. pedunculata* R. Br. (1810) as a synonym. The name "*C. lanata* Vahl", even if intended to be new, is a later homonym of *C. lanata* L. (1771), and would, therefore, be illegitimate. The former was placed in synonymy under *C. pedunculata* R. Br. by Lam (1919) and Moldenke (1959, 1971), although Vahl (1794) indicated clearly that the name *C. lanata* is that of Linnaeus, which applies to a species distinct from *C. pedunculata* R. Br. If, however, there is any element in Vahl's description that belongs to *C. pedunculata* R. Br. that element should be treated in the category of taxonomic misapplication of the name. I have not seen the specimen(s) on which Vahl based his description. In the present treatment, however, *C. lanata* sensu Vahl is not regarded as a synonym under *C. pedunculata* R. Br.

According to Lam (1919), the plant indumentum is of "stellate hairs" and "corolla sparsely and softly hairy or almost glabrous". During present investigations, the indumentum on stem, leaves and inflorescence was found to be mainly of dendriform hairs and the corolla always glabrous. Of all the Australian *Callicarpa* species, a softly hairy corolla is found only in *C. longifolia* Lam. A few hairs are also present on the outside of the corolla-lobes of *C. thozetii*, but no hairs were found on the corolla of any collection of *C. pedunculata* R. Br. excepting Jones 3951 (CANB).

In the following collections from New South Wales, the stamens, style and stigma are found to have hairs of various density: *Boorman s.n.* (NSW 145043); *Coveny & Hind 10571* (BRI); *Floyd 828* (NSW); *Jones 3951* (CANB); *Maiden & Boorman s.n.*, (NSW 145037). The presence of hairs on the sexual parts of these specimens seems an abnormal character because other collections from the same area have no hairs on their stamens and style. As mentioned above, the corolla in *Jones 3951* (CANB) is also somewhat hairy on the outside. In all other characters, these specimens agree closely with *C. pedunculata*.

Affinities

C. pedunculata is closely related to *C. thozetii* in its primary peduncles being longer than the petioles; lamina ferruginous-tomentose beneath; stem and inflorescence indumentum of stellate-dendriform hairs; corolla blue or violet; ovary glabrous, glandular;

fruit deep purple when ripe. However, *C. pedunculata* may easily be distinguished by its lamina being rounded or subcordate at the base; corolla glabrous all over and stamens and style much more exserted.

C. pedunculata is also very near to *C. caudata* in its lamina being rounded or subcordate at the base, ferruginous-tomentose beneath; primary peduncles longer than the petioles; corolla violet-mauve, glabrous; ovary glabrous, glandular, and fruit violet-purple when ripe. Nevertheless, *C. pedunculata* may easily be distinguished by its indumentum on stem and inflorescence being stellate-dendriform hairs; leaves ovate with a short tapering apex. In *C. caudata*, the hairs on stem and inflorescence are mainly simple, septate and leaves narrowly lanceolate with long tapering apex.

There is also a close resemblance between *C. pedunculata* and *C. macrophylla* in their lamina being rounded at the base; peduncles longer than the petioles; corolla violet-mauve, glabrous; indumentum on stem and inflorescence of stellate-dendriform hairs and ovary glabrous and glandular. The latter, however, may be readily identified by its lamina being greyish-white tomentose beneath, and fruit white when mature.

Acknowledgements

The author is grateful to Dr J.P. Jessop for comments on the draft of this manuscript and for assistance in translating into Latin the diagnosis of new species; to Mr Ludwik Dutkiewicz for preparing the illustrations, and Miss Barbara Welling for typing the manuscript.

Thanks are also due to the Director/Curators of the following institutions for the loan of herbarium specimens: ADW, BRI, CANB, CBG, DNA, HO, JCT, L, LAE, MEL, NSW, NT, PERTH, PNH, PR, QRS, SYD.

References

Adanson, M. (1763). *Jasmina. "Familles des Plantes"*. Vol. 2: 220-226. (Vincent: Paris).

Backer, C.A. & Bakhuizen van den Brink, R.C. (1965). Verbenaceae. "Flora of Java". Vol. 2: 594-614. (P. Noordhoff: Groningen).

Bailey, F.M. (1883). Verbenaceae. "A Synopsis of the Queensland Flora": 375-381. (Government Printer: Brisbane).

Bailey, F.M. (1890). Verbenaceae. "Catalogue of the indigenous and naturalized Plants of Queensland": 35. (Government Printer: Brisbane).

Bailey, F.M. (1901). Verbenaceae. "The Queensland Flora". Part IV: 1164-1185. (H.J. Diddams & Co.: Brisbane).

Bailey, F.M. (1913). Verbenaceae. "Comprehensive Catalogue of Queensland Plants". 381-387. (Government Printer: Brisbane).

Bentham, G. (1870). Verbenaceae. "Flora Australiensis". Vol. V: 31-70. (L. Reeve & Co.: London).

Bentham, G. & Hooker, J.D. (1876). Verbenaceae. "Genera Plantarum". Vol. 2: 1131-1160. (L. Reeve & Co.: London).

Bojer, W. (1837). Verbenaceae. "Hortus Mauritianus": 254-259. (A. Mamarot & Co.: Mauritius).

Briquet, J. (1895). Verbenaceae. In Engler, A. & Prantl, K., "Die natürlichen Pflanzenfamilien". IV, 3a: 132-182. (Wilhelm Engelmann: Leipzig).

Brown, R. (1810). Verbenaceae. "Prodromus Florae Novae Hollandiae et Insulae Van-Diemen": 510-514. (Richard Taylor & Co.: London).

Burkill, I.H. (1966). "A Dictionary of the economic Products of the Malay Peninsula". Vol. 1. Reprinted edition. (Malaysian Ministry of Agriculture: Kuala Lumpur).

Clarke, C.B. (1885). Verbenaceae. In Hooker, J.D., "The Flora of British India". Vol. IV: 560-604. (L. Reeve & Co.: London).

Dalla Torre, C.G. & Harms, H. (1904). Verbenaceae. "Genera Siphonogamarum ad Systema Englerianum Conscripta": 429-434. (Wilhelm Engelmann: Leipzig).

Domin, K. (1929). Beiträge zur Flora und Pflanzengeographie Australiens. *Bibl. Bot. Heft* 89 (vi): 551-562.

Durand, Th. (1888). Verbenaceae. "Index Generum Phanerogamorum": 319-322. (Dulau & Co.: London).

Endlicher, S.L. (1836). Verbenaceae. "Genera Plantarum Secundum Ordines Naturales Disposita". Vol. 1: 632-639. (Fr. Beck: Vienna).

Endlicher, S.L. (1841). Verbenaceae. "Enchiridion Botanicum": 311-314. (Wilhelm Engelmann: Leipzig).

Everist, S.L. (1974): "Poisonous Plants of Australia". (Angus & Robertson: Sydney).

Ewart, J. & Davies, O.B. (1917). Verbenaceae. "The Flora of the Northern Territory": 235-239. (McCarron, Bird & Co.: Melbourne).

Forbes, F.B. & Hemslay, W.B. (1890). An Enumeration of all the Plants known from China Proper, Formosa, Hainan, Corea, the Luchu Archipelago, and the Island of the Hong Kong, together with their distribution and synonymy. *J. Linn. Soc. (Bot.)* 26: 251-266.

Gaertner, J. (1791). "De Fructibus et Seminibus Plantarum". Vol. 2. 80-81. (G.H. Schramm: Tubingen).

Gardner, C. (1931). Verbenaceae. "Enumeratio Plantarum Australiae Occidentalis". Part III: 111-113. (Government Printer: Perth).

Hooker, J.D. (1859). "The Botany of The Antarctic Voyage". Part III. Flora Tasmaniae. Vol. I: XLVI. (L. Reeve: London).

Junell, S. (1934). Zur Gynäceummorphologie und Systematik der Verbenaceen und Labiaten. *Symb. Bot. Upsal.* 4: 1-219.

Jussieu, A.L. (1789). Vitices. "Genera Plantarum Secundum Ordines Naturales Disposita": 106-110. (Viduam Herissant & T. Barrois: Paris).

King, G. & Gamble, J.S. (1909): Verbenaceae. "Material for a Flora of The Malayan Peninsula". Vol. 4: 1004-1079. (W. Newman & Co.: London).

Lam, H.J. (1919). "The Verbenaceae of the Malayan Archipelago". (M. De Waal: Groningen).

Lamarck, J.B.A.P. de (1783). "Encyclopedie Methodique Botanique". Vol. 1. (Plomteux: Liege).

Lamarck, J.B.A.P. de (1791). "Tableau Encyclopedique et Methodique des Trois Regnes de la Nature. Botanique". Vol. 1. (Pancoucke: Paris).

Lemée, A. (1843). Verbenaceae. "Dictionnaire descriptif et Synonymique des Generes de Plantes phanerogames". Vol. 8b: 650-657. (Imprimerie Commerciale et Administrative: Brest).

Linnaeus, C. (1747). "Flora Zeylanica". (J. Wetstein: Amsterdam).

Linnaeus, C. (1753). "Species Plantarum". ed. 1, Vol. 1. (Laurentius Salvius: Stockholm).

Linnaeus, C. (1771). "Mantissa Plantarum Altera Generum editionis VI & Specierum editionis II". (Laurentius Salvius: Stockholm).

Lopez-Palacios, S. (1977). Verbenaceae. "Flora De Venezuela". (University de Los Andes: Merida).

Loureiro, J. (1793). "Flora Cochinchinensis". edn 2. Vol. 1. (Haude & Spener: Berlin).

Maximowicz, C.J. (1887). Verbenaceae orientalasiaticae. *Bull. Acad. Imp. Sc., St. Petersb.* Vol. 31: 73-105.

Meisner, C.F. (1840). Verbenaceae. "Plantarium Vascularium Genera Secundum Ordines Naturales Digesta". Vol. 1. "Tabulis Diagnosticis": 290-292. Vol. 2. "Commentarius": 197-200. (Libraria Weidmannia: Leipzig).

Merrill, E.D. (1923). Verbenaceae. "An Enumeration of Philippine Flowering Plants". Vol. 3: 38-408. (Bureau of Science: Manila).

Miquel, F.A.W. (1858). Verbenaceae. "Flora Indiae Batavae". Vol. 2: 856-913. (C.G. van der Post: Amsterdam).

Moldenke, H.N. (1936). A monograph of the genus *Callicarpa* as it occurs in America and in cultivation. *Fedde Repert. Sp. Nov. Reg. Veg.* Vol. 39: 288-317. Vol. 40: 38-131.

Moldenke, H.N. (1959). "A Résumé of the Verbenaceae, Avicenniaceae, Stilbaceae, Symporemaceae, and Eriocaulaceae of the World as to valid taxa, geographic distribution and synonymy". (H.N. Moldenke: Mountainside, New Jersey).

Moldenke, H.N. (1971). "A Fifth Summary of the Verbenaceae, Avicenniaceae, Stilbaceae, Dicrastylidaceae, Symporemaceae, Nyctanthaceae, and Eriocaulaceae of the World as to valid taxa, geographic distribution, and synonymy". Vol. 1 & 2. (H.N. Moldenke: Wayne, New Jersey).

Moldenke, H.N. (1971). Additional materials toward a monograph of the genus *Callicarpa*. XV. *Phytologia* 21: 208-242.

Mueller, F.V. (1882). Verbenaceae. "Systematic Census of Australian Plants". Part 1. Vasculares: 102-103. (McCarron, Bird & Co.: Melbourne).

Mueller, F.V. (1889). Verbenaceae. "Second Systematic Census of Australian Plants". Part 1. Vasculares: 171-173. (McCarron, Bird & Co.: Melbourne).

Murray, J.A. (1774). "Caroli a Linné Systema Vegetabilium Secundum Classes, Ordines, Genera, Species cum Characteribus et Differentiis". (J.C. Dietrich: Göttingen).

Necker, N.J. (1790). "Elementa Botanica Genera Genuina, Species Naturales Omnia Vegetabilium". (Societas Typographica: Neowedae ad Rhenum).

Prain, D. (1963). Verbenaceae. "Bengal Plants". Reprint edition. Vol. 2: 614-626. (Botanical Survey of India: Calcutta).

Raeuschel, E.A. (1797). "Nomenclator Botanicus". Edition 3. (J.G. Feind: Leipzig).

Reichenbach, H.G.L. (1828). Labiateae. "Conspectus Regni Vegetabilis Per Gradus Naturales Evoluti". Part 1: 115-117. (Carolus Cnobloch: Leipzig).

Ridley, H.N. (1923). Verbenaceae. "The Flora of the Malay Peninsula". Vol. 2: 611-642. (L. Reeve & Co.: London).

Roemer, J.J. & Schultes, J.A. (1818). "Caroli a Linné Systema Vegetabilium. Secundum. Classes. Ordines Genera Species". Vol. 3: (J.G. Cotta: Stuttgart).

Roemer, J.J. & Schultes, J.A. (1827). "Mantissa in Volumen Tertium Systematis Vegetabilium Caroli a Linne ex Editionis". Vol. 3. (J.G. Cotta: Stuttgart).

Roth, A.W. (1821). "Novae Plantarum Species Praesertim Indiae Orientalis ex Collectione Dr Benjamin Heynii". (Vogler: Habberstadt).

Roxburgh, W. (1814). *Tetrandria Monogynia*. "Hortus Bengalensis, or A Catalogue of the Plants growing in The Honourable East India Company's Botanic Garden at Calcutta". 83. (C.H. Pearson: Calcutta).

Roxburgh, W. (1820). *Tetrandria Monogynia*. "Flora Indica or Descriptions of Indian Plants. Edited by William Carey, to which are added descriptions of Plants more recently discovered by N. Wallich. Vol. I: 405-411. (Missions Press: Serampore, Calcutta).

Rüling, J.P. (1774). *Sambuci*. "Ordines Naturales Plantarum Commentatio Botanica". 61. (A. Vandenhoeck: Göttingen).

Schauer, J.C. (1847). Verbenaceae. In de Candolle, A., "Prodromus Systematis Naturalis Regni Vegetabilis". Vol. XI: 522-700. (Victoris Masson: Paris).

Spreng, K. (1825). *Tetrandria Monogynia*. "Caroli Linnae I, Systema Vegetabilium Editio Decima, Sexta". Vol. 1: 419-421. (Dietrich: Göttingen).

Stafleu, A. (1967). "Taxonomic Literature". (International Bureau for Plant Taxonomy and Nomenclature: Utrecht).

Vahl, M. (1794). *Callicarpa*. "Symbolae Botanicae sive Plantarum Tam earum,". Part 3: 12-14. (Nicolae Möller et Filius: Hauniae).

Walpers, W.G. (1845). Verbenaceae. "Repertorium Botanices Systematicae". Vol. 4: 3-314. (Fr. Hofmeister: Leipzig).

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Collector names are in alphabetical order, and their numbers (in Arabic numerals) are followed by the number (in Roman numerals) given below to each species. T indicates (holo-, lecto- or syn-) types of the species indicated.

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<i>C. longifolia</i>	= II	<i>C. caudata</i>	= VI
<i>C. brevistyla</i>	= III	<i>C. pedunculata</i>	= VII
<i>C. candicans</i>	= IV		
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